



The Indianapolis Private

Industry Council is a

business-led organization

serving as advisor, advocate

and agenda setter for

workforce development by

integrating resources and

leveraging funding based

on the needs of employers

and job seekers.

December 30, 2005

Mr. Ron Stiver
Commissioner, Indiana Department of Workforce Development
10 N. Senate Ave.
Indianapolis, IN 46204

Dear Commissioner:

On behalf of the members of the Economic Growth Region 5 consortium, I am submitting the attached Root Causes Report.

During the root causes phase, EGR 5 has been busy analyzing our labor market information studies and continuing to further our research on occupational and skill shortages. To substantiate our findings, we have held meetings throughout the region with consortium members, industry partners, local economic development professionals and the business community. We look forward to the next phase of the Strategic Skills Initiative where we will develop solutions to the root causes identified in this report.

The Root Causes Report is being emailed in a digital format. A hard copy of the report including the required signatures, letters of support and executive summary, will also be delivered to you.

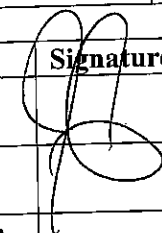
Thank you for your time and interest in our report.

Sincerely,

Joanne Joyce
President and Chief Executive Officer

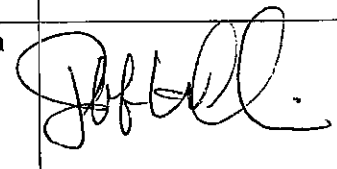
**Strategic Skills Initiative Root Cause Report
Cover Sheet**

Economic Growth Region # 5 : _____

Designated Grantee			
Organization Name: INDIANAPOLIS PRIVATE INDUSTRY COUNCIL, INC.		Telephone Number: 317-639-4441	
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Address:		Email Address:	
City: INDIANAPOLIS	State: IN	Zip + 4: 46204	
County:	FEIN: 35-1569069		
Contact Person			
↑ Mr. ↑ Ms. X ↑ Dr. ↑ Other	First Name: CAROLYN	Last Name: BROWN	
	Title: VICE PRESIDENT	Telephone Number: 317-684-2440	
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Member:	Name		
Lead Team Members			
Name:	Industry:	Title:	Signature:
JOHN CRISP	REAL ESTATE	Vice President	
BOB FRANCIS	MANUFACTURING	General Manager	
JEFF WILLIAMS	HEALTHCARE	Director of Human Resources, Engineering and Business Development	
MIKE KIRCHOFF	ECON DEVELOP	Vice President	
JOE TRIMPE	LOGISTICS	Senior Recruitment Specialist	
PAT VERCAUTEREN	EDUCATION	Director for Apprenticeship and Workplace Learning	

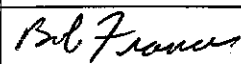
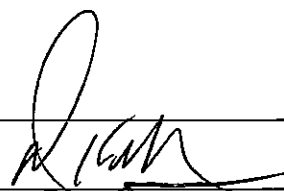
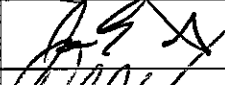

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Strategic Skills Initiative Skills Root Causes Report
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JOE TRIMPE	LOGISTICS	Senior Recruitment Specialist	
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**COLLIERS
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MARTIN
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December 22, 2005

Mr. Ron Stiver
Commissioner, Indiana Department of Workforce Development
10 North Senate Avenue
Indianapolis, IN 46204

Dear Mr. Stiver:

It is my pleasure, as a lead team member of the Economic Growth Region 5 (EGR 5) consortium, to submit this letter of support as part of our Strategic Skills Initiative (SSI) work and, more specifically, the findings in the attached Root Causes report.

We in central Indiana are fortunate that so much work has been done to identify our region's high-growth industries and studies indicate that we are experiencing, or can expect to experience, a shortage of workers in several industrial clusters. During the Root Causes phase, members of the EGR 5 consortium worked closely to more specifically quantify these phenomena by drilling down in to the critical occupations selected during the Occupation and Skill Shortages phase.

As an EGR 5 lead team member, SSI project staff have provided me with the opportunity to provide input on critical issues and participate in group and one-on-one meetings, as well as provided bi-weekly updates on progress.

Based on EGR 5 collaboration through the first two phases of the SSI process, we are well positioned to explore, develop and implement solutions as required in the next phase of the initiative. We look forward to continued collaboration and hope to identify and implement viable solutions for our workforce.

Sincerely,



John A. Crisp, SIOR
Vice President
Commercial Sales & Leasing



mitsubishi heavy industries climate control, inc.

December 20, 2005

Mr. Ron Silver
Commissioner, Indiana Department of Workforce Development
10 N. Senate Ave.
Indianapolis, Indiana 46204

Dear Mr. Silver:

I'm pleased to have been selected as a lead team member of the Economic Growth Region 5 consortium. My background is manufacturing and I have worked for three manufacturing companies in Marion, Shelby and Johnson Counties over the last 25 years. I'm writing this letter in support of the Strategic Skills Initiative process and root cause analysis that has recently been completed relative to several critical occupations in our area (EGR-5). A lot of ground has been covered in a relatively short period of time and I can honestly say that I agree with the findings and the progress that has been made.

Sincerely,

Bob Francis
General Manager of Human Resources



Major Hospital
150 West Washington Street
Shelbyville, Indiana 46176
(317) 392-3211
(317) 398-5252 Administration
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December 22, 2005

Mr. Ron Stiver,

Commissioner, Indiana Department of Workforce Development
10 N. Senate Ave.
Indianapolis, IN 46204

Dear Mr. Stiver:

As a lead team member of the Economic Growth Region 5 consortium, I want to submit this letter of support as part of our Strategic Skills Initiative work, and more specifically the findings in the attached Root Causes report.

During the Root Causes phase, members of the EGR 5 consortium worked closely to drill down in to the critical occupations selected during the Occupation and Skill Shortages phase.

Speaking for my own business sector healthcare, I think this report clearly gets to the root causes of the key staff shortages my industry is currently experiencing. Educational capacity and wages are ranked "High" in the top three healthcare occupations, RNs, LPNs and Allied Health Professionals. The high factoring of wages is really driven by supply and demand economics created by a lack of educational capacity.

Based on EGR 5 collaboration through the first two phases of the SSI process we are now ready to explore, develop and implement solutions as required in the next phase of the initiative. We look forward to continued collaboration and hope to identify and implement viable solutions for our workforce.

Sincerely,

Jeffery L Williams
Chair Central 8 Workforce Investment Board,
Director of Human Resources, Engineering
& Business Development
Major Hospital



111 Monument Circle | Suite 1800 | Indianapolis, Indiana 46204
1.317.236.6262 | 1.877.236.4332 | fax: 1.317.236.6275

December 29, 2005

Mr. Ron Stiver
Commissioner
Indiana Department of Workforce Development
10 North Senate Avenue
Indianapolis, Indiana 46204

Dear Mr. Stiver:

The Indy Partnership is a regional economic development organization headquartered in Indianapolis and dedicated to strengthening the economic growth throughout our 11-county region. Nine of our counties (Marion and adjacent counties) comprise Economic Growth Region 5 - a diverse region home to more than 1.7 million people. Since the creation of the Strategic Skills Initiative (SSI), The Indy Partnership has participated as a member of the lead team for the region's SSI consortium.

During the past several months, the consortium has conducted a detailed occupation and skill shortage analysis as well as an analysis of the root causes of the identified shortages. While our region is fortunate to have many promising industrial sectors such as advanced manufacturing, life sciences, logistics, motorsports, and others, these sectors are increasingly challenged by labor shortages in key occupations. The attached root causes report provides an analysis of the critical occupations and the basis for the shortages.

Based on our region's collaboration through the first two phases of the Strategic Skills Initiative, we believe it is well positioned to explore, develop and implement solutions during the next phase of the initiative. We look forward to continued collaboration as we help identify and implement viable solutions for our workforce, and are pleased to submit this letter of support for the effort and findings to date and in anticipation of our future collaborative effort.

Sincerely,

Tom King, Chairman
Board of Directors

www.indypartnership.com



December 29, 2005

Mr. Ron Stiver
Commissioner, Indiana Department of Workforce Development
10 N. Senate Ave.
Indianapolis, IN 46204

Dear Mr. Stiver:

It is my pleasure, as a lead team member of the Economic Growth Region 5 consortium, to submit this letter of support as part of our Strategic Skills Initiative work, and more specifically the findings in the attached Root Causes report.

We in central Indiana are fortunate that much work had been done to identify our region's high-growth industries and studies indicated that we are experiencing or can expect to experience a shortage of workers in several industrial clusters. During the Root Causes phase, members of the EGR 5 consortium worked closely to more specifically quantify these phenomena by drilling down in to the critical occupations selected during the Occupation and Skill Shortages phase.

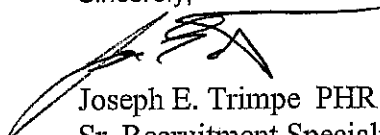
There are several issues that were brought to the table concerning what we feel are serious factors that will continue to provide a challenge for employers to fill future job vacancies. One of the key factors for my particular company is the lack of viable public transportation to the Indianapolis Airport. The incredible growth of FedEx Express and in particular, our Indianapolis Hub facility, may see an increase of up to 4000 new jobs in the next ten to fifteen years. There are numerous potential applicants in our market that would be an ideal fit for our opportunities. The lack of a public transportation system that is user friendly and easily accessible will continue to be a deterrent for us to attract an untapped applicant pool.

We also found that there is a lack of promotion in the educational system about the career opportunities in the non-traditional fields, such as transportation. This is a critical factor for employers to be able to fill vacancies in the future. This is a task that both the employers and educators must tackle together.

As an EGR 5 lead team member, SSI project staff has provided me with the opportunity to provide input on critical issues and participate in group and one-on-one meetings as well as provided bi-weekly updates on progress.

Based on EGR 5 collaboration through the first two phases of the SSI process we are well position to explore, develop and implement solutions as required in the next phase of the initiative. We look forward to continued collaboration and hope to identify and implement viable solutions for our workforce.

Sincerely,



Joseph E. Trimpe PHR
Sr. Recruitment Specialist
FedEx Express
Indy Recruitment Center



December 27, 2005

Mr. Ron Stiver
Commissioner, Indiana Department of Workforce Development
10 N. Senate Ave.
Indianapolis, IN 46204

Dear Ron:

As a lead team member of the Economic Growth Region 5 consortium, I am submitting this letter in support of our Strategic Skills Initiative work, and more specifically the findings in the Root Causes report. Ivy Tech is pleased to be a part of the SSI process.

We, in central Indiana, are fortunate that much work has been done to identify our region's high-growth industries and studies indicate that we are experiencing or can expect to experience a shortage of workers in several industry clusters. During the Root Causes phase, members of the EGR 5 consortium worked closely to more specifically qualify these phenomena by drilling down into the critical occupations selected during the Occupation and Skill Shortages phase.

During our Lead Team and over all consortium meetings the majority of our discussion centered on occupations in demand in advanced manufacturing, Life Sciences and logistics. In manufacturing, we found that workers entering the job market are not aware of a career path, or training skills required. In direct health care there are bottlenecks in the training process and in logistics there are language issues we are preparing to deal with.

The combined WIB staff has prepared the studies and research necessary for the SSI consortium to make sound decisions through the first two phases of the SSI process. We believe that we are well positioned to explore, develop, and implement a plan that will strengthen the availability of workers in critical occupations and the skills for those workers to achieve success.

Sincerely,

A handwritten signature in black ink, appearing to read 'Patrick Vercauteren', written over the word 'Sincerely,'.

Patrick Vercauteren
Ivy Tech Community College

50 WEST FALL CREEK PARKWAY NORTH DRIVE
INDIANAPOLIS, INDIANA 46208-5752
317-921-4882

Strategic Skills Initiative Strategic Skills Initiative

Root Causes Report

Economic Growth Region 5

Dec. 30, 2005



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Economic Growth Region 5 Root Causes Report

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I. Introduction

In June 2005, the state of Indiana announced a \$23 million initiative called the Innovating Indiana Strategic Skills Initiative with the goal of building regional and local capacity among the workforce and economic development organizations. The purpose of the initiative was to partner workforce development professionals with local and regional businesses and economic development officials so they could identify key occupational and skill shortages, their root causes and a regional solution to increase the pay of the working Hoosier.

As stated in Economic Growth Region 5's application for funding, the Strategic Skills Initiative aims to achieve two primary goals:

- 1) Identify and alleviate present and future shortages of critical occupations and specific cross-cutting skills sets within the industries that drive Indiana's economy, and
- 2) Support a demand-driven approach to workforce development at the regional and local levels.

To accomplish these two goals, EGR 5 conducted four labor market information studies; evaluated the Job Vacancy Survey by ERISS Corp.; put together a consortium of the above-mentioned groups; held consortium lead team meetings; and hired an economist to work with the findings of the labor market studies. The key industries and clusters selected for EGR 5 are advanced manufacturing; health care and biotechnology; logistics; and automotive and motor sports.

These four sectors combine to account for nearly a third of all employment in the region, and a larger share of the region's wages. Health care and manufacturing are the first and second sectors in terms of employment. Health care and logistics have a pattern of strong growth and are projected to continue growing. Automotive and motor sports are a field with untapped potential in this community that local and state officials are striving to develop. Manufacturing may grow only incrementally overall in this region in the coming years, but some subsectors in manufacturing will grow substantially. The large size of manufacturing and its historical importance in the community convinces us to stand by manufacturing despite its uncertain future.

The labor market studies gave EGR 5 great insight into what occupations were in demand and the cost of chronic skill shortages. The consortium went further and proposed two to four occupations for each sector and narrowed the list to 13 critical occupations on which it wanted to focus in the Occupation and Skill Shortages and Root Causes Analysis reports. In both reports, EGR 5 focuses on the following occupations: registered nurse, licensed practical nurse, allied medical professional, nursing aide, automotive service technician, machinist, machine operator, welder, precision inspector, chemical machine operator, logistics supervisor, truck driver and warehouse laborer.

While the Occupation and Skill Shortages report identified occupations and skill sets that are critical to EGR 5's key industries, the purpose of this Root Causes report is to focus on the underlying forces behind the shortages. This report will look at how and how much the demand and supply side contribute, as well as demographic and other factors. EGR 5 accomplished these tasks by supplementing our past research with additional data analysis on wages in EGR 5 versus surrounding regions; wages for critical jobs versus other jobs in EGR 5; a human resources survey conducted jointly with the Greater Indianapolis Chamber of Commerce; analysis of an 11th-grade survey on occupations conducted by Learn More Resource Center; analysis of additional reports on skill shortages in nursing and trucking; and nearly 30 interviews with experts in the specific fields of occupations on which we focus in this report.

The cost of chronic skill shortages

The Strategic Skills Initiative is designed to identify, understand and solve chronic skill shortages. Throughout Indiana and the United States, these shortages exist in many diverse occupations. Hiring qualified workers is a constant challenge for employers. Many say their staffing roster is continually short,

sometimes by large numbers. We have heard from employers in the logistics industry who say they would hire 50 or even 100 workers tomorrow, if they could be found, and that from the start of the year to the end they are never fully staffed.

These shortages have serious consequences for businesses. Although a smaller roster would suggest payroll savings, short-staffing actually costs more. Companies must pay overtime wages or hire more expensive contract or temporary workers. These added expenses diminish profits. But the work must be done. The only alternative -- failing to meet the deadline -- is untenable. It would lead to cancelled contracts and the demise of the company.

One regional hospital reports that short-term contract nurses often cost more than twice the standard rate. But the hospital has no choice but to pay the premium. It is obliged to provide a standard of care, and part of that standard is the ratio of registered nurses to patients during every shift. The same source suggests that hospitals will sometimes leave beds vacant rather than admit patients while the hospital is understaffed.

Allied medical professionals do not figure in the staffing ratios in the same way as nurses, yet these positions, too, affect the quality of care and the financial outcomes. When technicians are unavailable, patients will be sent home and their treatment rescheduled. This leads to patients' dissatisfaction with the quality of care. It also causes the additional, unnecessary clerical expense of rescheduling a patient.

In manufacturing and logistics, too, chronic understaffing leads to problems beyond added cost. The safety of workers and the quality of output can suffer when too few people are working too many hours. This is recognized in the trucking profession, where rules limit the number of hours a trucker may drive before he must get off the road and rest.

When workers are compelled to work extra hours and unwanted shifts, they become frustrated. Eventually they quit, making the employer even more short-staffed. The data on turnover rates in each industry verify that employment in many jobs is a revolving door rather than the steady relationship that employers seek. Many failing companies could erase their deficits and become profitable simply by reducing turnover -- not to zero, but to a manageable minimum.

There is a further, long-term problem. It is well known that the current workforce in most industries is aging, and that up to half of all employees will retire during the next decade. In some areas of the United States, there will be too few people to fill the slots left empty by retirees. We do not expect an absolute decline in EGR 5, yet we share the concern about the retirees. In diverse positions from machinist to medical technologist, skill is acquired through experience. A large number of retirees in a short span of time means a loss of acumen -- unless their experience is passed to a new generation. That new generation needs to be on the job now, working alongside its experienced elders and learning from them. Even if an adequate number of individuals steps up after 2010 to fill the vacancies left by retirees, those new workers will lack the experience to do their jobs well. That is another cost of today's chronic skill shortages.

The critical occupations in context

Table 1 lists the occupations that were identified in the Occupations and Skill Shortages Report, along with estimates of employment in EGR 5.

Table 1
Critical Occupations, EGR 5

SOC	Occupation	Employment in EGR 5
Health care and biotechnology		
29-1111	Registered nurses	16,030
29-2000	Allied medical professions ¹	13,280
29-2061	Licensed practical nurses	5,390
31-1012	Nursing aides	8,230
Automotive and motor sports		
49-3023	Automotive service technicians	4,800
51-4041	Machinists	3,560
Advanced manufacturing		
51-4000	Production machine operators ²	12,040
51-4121	Welders	2,320
51-9061	Inspectors, testers, weighers and sorters	4,240
51-9011	Chemical machine operators	
Logistics		
53-1031	Supervisors of transportation workers	2,350
53-3032	Truck drivers, heavy and tractor-trailer	12,890
53-7062	Laborers and freight, stock and material movers	18,240

Source: *egr5_occupations.xls* datasheet.

¹ Allied medical professions are a diverse group of occupations containing substantially the same skill set. The allied medical professions include health technologists and technicians; clinical laboratory technologists and technicians; medical and clinical laboratory technologists; medical and clinical laboratory technicians; dental hygienists; diagnostic-related technologists and technicians; cardiovascular technologists and technicians; diagnostic medical sonographers; nuclear medicine technologists; radiologic technologists and technicians; emergency medical technicians and paramedics; health diagnosing and treating practitioner-supporting technicians; dietetic technicians; pharmacy technicians; psychiatric technicians; respiratory therapy technicians; surgical technologists; medical records and health information technicians; dispensing opticians; miscellaneous health technologists and technicians; orthotists and prosthetists; and other health care practitioners and technical occupations.

² Production machine operators include a wide variety of production occupations. The category includes computer control programmers and operators; computer-controlled machine tool operators; numerical tool and process control programmers; forming machine setters, operators and tenders; extruding and drawing machine setters, operators and tenders; forging machine setters, operators and tenders; rolling machine setters, operators and tenders; machine tool cutting setters, operators and tenders; cutting, punching and press machine setters, operators and tenders; drilling and boring machine tool setters, operators and tenders; grinding, lapping, polishing and buffing machine tool setters, operators and tenders; lathe and turning machine tool setters, operators and tenders; milling and planning machine setters, operators and tenders; model makers and pattern makers; molders and molding machine setters, operators and tenders; foundry mold and coremakers; molding, coremaking and casting machine setters, operators and tenders; multiple machine tool setters, operators and tenders; tool and die makers; and miscellaneous metalworkers and plastic workers. Although these occupations are numerous, they require substantially the same skill set. Workers trained in one occupation can transfer easily to another production machine.

The critical occupations are a fraction of the regional labor market. By generous estimates, the targeted occupations represent about 12 percent of all jobs in the EGR 5 labor market. They represent less than one job in nine in the region.

The following series of four charts shows how the occupations stack up within their industries. Each of the four charts shows a full pie representing the total employment in the industry and a wedge for each of the critical occupations showing employment in proportion to total employment.

Chart 1
Critical Occupations in the Health Care Industry

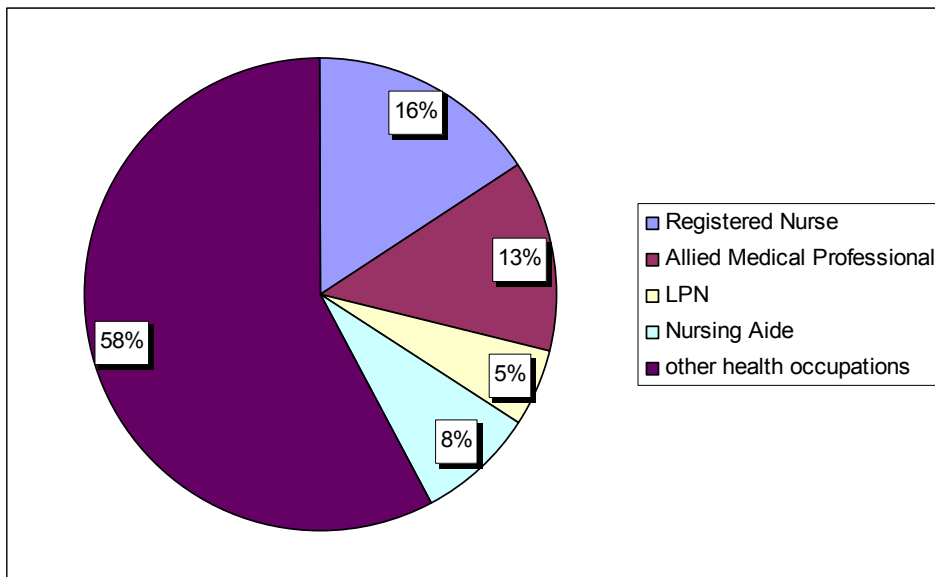


Chart 2
Critical Occupations in Advanced Manufacturing

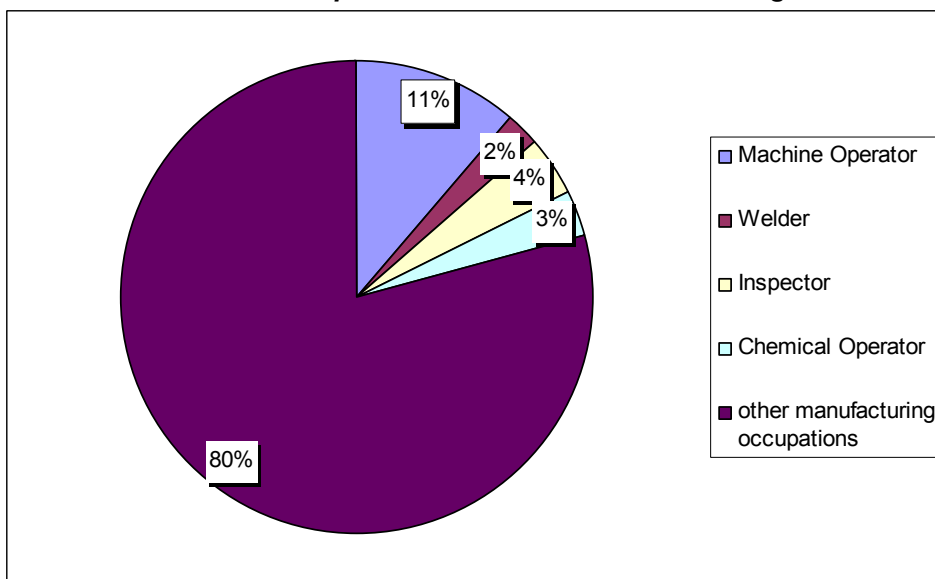


Chart 3
Critical Occupations in the Logistics Industry

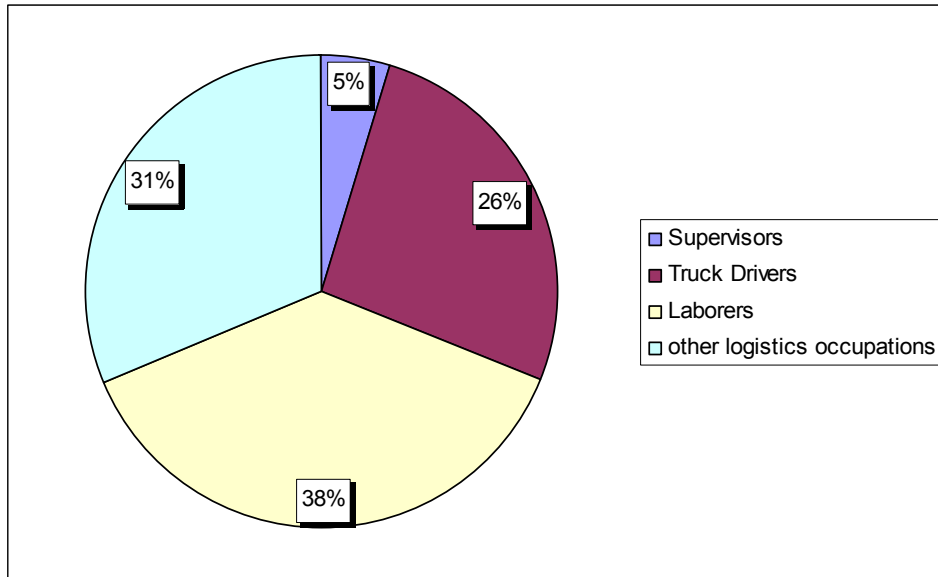
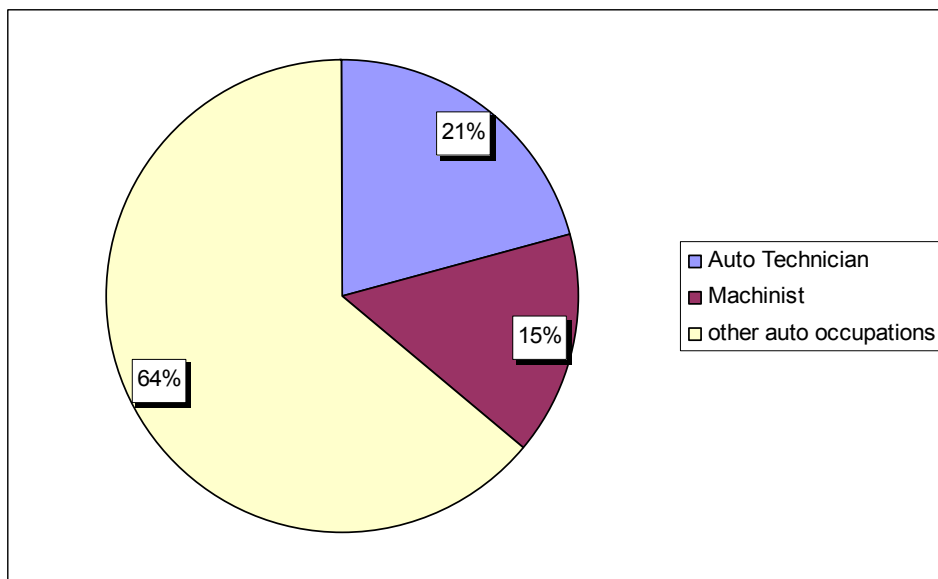


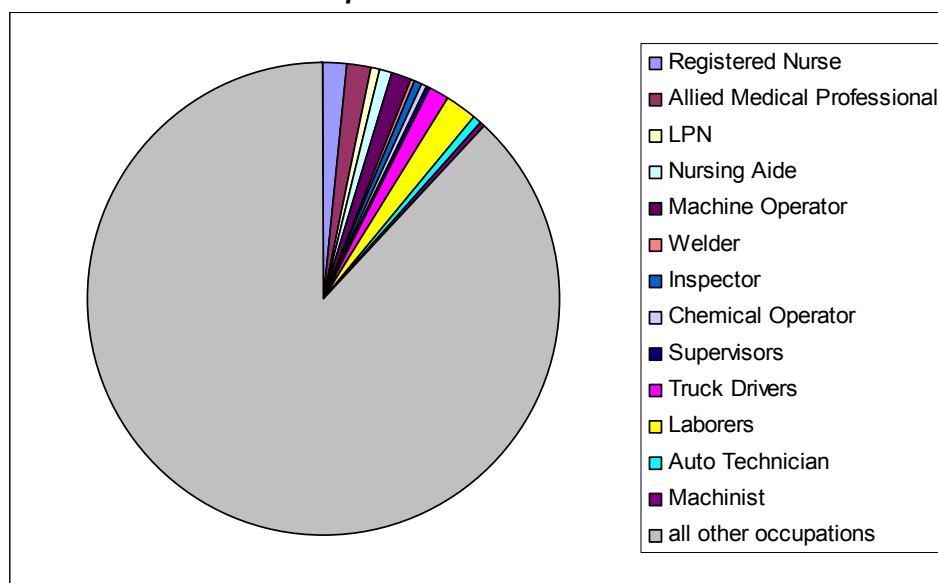
Chart 4
Critical Occupations in the Automotive and Motor Sports Cluster



The foregoing charts show that only in logistics do the critical occupations constitute a majority of all jobs. The three critical occupations account for 69 percent of total jobs in logistics. The four critical occupations in health care represent 42 percent of the health care total. In the automotive and motor sports cluster, the two critical occupations make up 36 percent of all jobs. Finally, in advanced manufacturing, the four critical occupations amount to only 20 percent of all manufacturing jobs.

The critical occupations represent significant shares of their respective industries, though not usually majority shares. When we look at our critical occupations in the context of the total labor market of EGR 5, we see 13 small slices of a very large pie. Chart 6 provides a view of the 13 critical occupations as shares of the total EGR 5 labor force.

Chart 5
Critical Occupations in the EGR 5 Labor Market



The chart reminds us that our critical occupations are not 600-pound gorillas. Within the labor market of more than 700 distinct occupations and more than 800,000 total jobs, our 13 occupations do not dominate. Even though registered nurse is the single largest occupation in health care, it still is only 16 percent to 27 percent of all health care jobs, and less than 2 percent of EGR 5's total labor force. Warehouse laborers also are about 2 percent of the region's total jobs. All other critical occupations are smaller.

At other times and places, certain occupations dominated the labor force in a community. Workers were drawn to them. A century ago in the hollows of Kentucky and West Virginia, young men had few alternatives to coal mining. Even a generation ago, auto plants dominated the Hoosier cities of Anderson and Kokomo, as steel dominated the Gary region.

EGR 5 is diversified. The largest industry (manufacturing) is only 12 percent of the total. The largest occupational group (office and administrative workers) is only 18 percent of all jobs. And that 18 percent is not a single occupation, but more than 20 different kinds of clerks, filers and administrative assistants.

Thus, a fundamental cause of labor shortage for the critical occupations may be competition in the labor market. The word "pipeline" suggests a controlled and well-regulated flow of workers into a particular occupation. In reality there is not a single entry and exit for most occupations. The labor market encourages workers to reconsider their career frequently.

The same is true for students. College attrition rates are high because students reassess their plans and change directions while they are in the pipeline. Enrollment in a college course designed to prepare a student for a specific career in no way ensures that the student will enter that career four years later.

The critical occupations represent a few options out of hundreds. Workers reconsider and change their path many times. Economic theory suggests that free individual choice should end with every job filled and every worker employed. But the market isn't working, and the result is chronic shortages in the critical occupations. We must look deeper to see what adverse influences are impeding the market. The following section examines six factors that impinge on the labor market and potentially trigger the skill shortages.

II. Discussion of Root Causes and Their Impacts

► Principle Factors

Human Resources Capacity

Human resources capacity varies from firm to firm. Some firms are very aggressive and sophisticated; others have no policies at all. Previous research in central Indiana and across the United States explains why some companies perform the human resources function better than others. Company managers in EGR 5 were interviewed for this report, but the number was not sufficient to yield statistically valid generalizations about our region. Our limited findings validate the previous research on the subject, explained below.

"It is not a question of whether they have optimal HR policies or not. Most small employers don't have anything written down at all."

Jeanine Motsay
Business Services, IPIC

The main factor that determines HR capacity is the size of the company. Firms with fewer than 50 employees seldom have a full-time professional managing personnel and human resources, while those with more than 100 employees nearly always do.³ This tends to be true regardless of the type of business. Small medical businesses such as dentists' offices will not have personnel departments, while large medical businesses such as hospitals will. The same can be said of small and large trucking companies, small and large retail stores, etc. In smaller firms the responsibility for hiring, managing personnel, providing training and retaining workers is shared among departments.

In 2004, the Indianapolis Private Industry Council Inc., in conjunction with the Greater Indianapolis Chamber of Commerce, surveyed employers about their human resources needs.⁴ Employers were asked what kinds of business services they might use if they were available. This question is tantamount to asking the employer in which HR functions they are deficient, and which they consider to be outside the company's core function. Table 2 lists the most common answers along with the percentage of respondents giving that answer.

Table 2
Human Resources Survey Responses

HR Function	Percent
Training workshops on supervisory skill	64
Training workshops on conflict management and resolution	62
Free electronic posting of job openings	62
Training workshops on recruiting, screening and hiring	47
Training for HR staff on employment law	47
Ongoing employee relations advice and consulting	47
Training workshops on diversity	45
Wage and benefit surveys for target markets	44
Assessments of workers for training and promotions	44

Source: IPIC and the Greater Indianapolis Chamber of Commerce, 2004.

³ Human Resource Strategies, Stages of Development and Organization Size Survey, Society for Human Resource Management Research, Fisher College of Business, The Ohio State University, 2001.

⁴ The survey addresses only Marion County – not the whole of EGR 5. Similar data for the region do not exist and the SSI schedule does not allow us to conduct a broader survey. The sample size of the survey was N=55 and was balanced among firms of various sizes.

A majority or near-majority of employers in the survey admit deficiency in basic personnel management. The responses are, in a sense, an appeal for help. They are an admission that hiring is a lengthy process, and managing personnel a costly and perplexing one.

The data show that large firms nearly always have a fully developed HR department while small ones are deficient. All hospitals exceed the threshold of 100 employees where HR capacity expands to meet the need. The majority of logistics firms and manufacturers probably employ 100 or more. Many ambulatory care facilities and doctor's offices are very small and may have HR incapacities. Recent investigation in EGR 5 confirms this.

The survey data, recent regional interviews and published wisdom points to one conclusion. To the extent that employers of a critical occupation tend to be new companies or small companies, human resources capacity is probably an issue.

"The hospitals are very creative in recruiting personnel. There are lots of ways to find people and we are trying them all."

Jeff Williams
Major Hospital, Shelbyville

The size of the firm is the most significant factor in predicting its HR capacity, but it is not conclusive by itself. The labor market is complex, and the labor pool is unpredictable. Another survey suggests that employers may get poor results in their efforts to hire because they do not understand the expectation of job candidates.⁵ According to the National Association of Manufacturers, employers emphasize wage rates, while job candidates expect much more:

Despite an emerging desire for building a high-performance workforce and attracting highly engaged workers, the majority of respondents to the survey continue to use traditional recruiting strategies. Manufacturers cited competitive wages and health care and retirement benefits as their top methods for attracting employees – which for most employees are considered a given rather than the differentiators.⁶

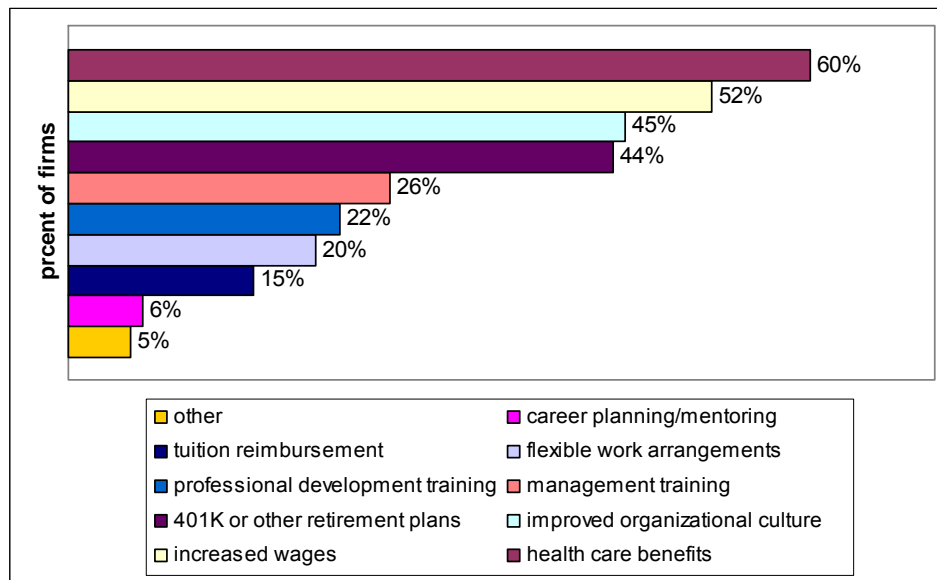
The Manufacturing Institute's report finds an overall deficiency in recruiting among employers, but also identifies some encouraging trends. Several unusual perquisites have been influential in recruiting and retaining workers. Chart 6 suggests some benefits, workplace characteristics or other perks that may become more popular in the years to come.

Chart 6

⁵ 2005 Skills Gap Report – A Survey of the American Manufacturing Workforce, Deloitte Consulting LLP for The Manufacturing Institute, 2005.

⁶ Ibid, p. 9.

Employee Benefits



The chart shows that wages and health care benefits are used by a majority of employers as a means of attracting and retaining workers. A second tier of tactics (retirement benefit and improved corporate culture) are common among nearly half of companies, if the survey is representative. Perhaps most interesting is the third tier of tactics, which are now used by 15 percent to 26 percent of employers. These emerging practices appeal to the workers' desire for personal development. They include various kinds of training and flexible work schedules.

It is important to note that the results in chart 6 are not definitive. The less-popular tactics discussed in the chart are new and largely untried; they are not necessarily the least effective.

There also are new tactics for recruiting in EGR 5. Consider the trucking company that recruits husband-and-wife driving teams as a response to the complaint that driving keeps one away from his or her loved one. Or consider the hospital group that recruits nurses internationally, most recently in Ireland. The developing Indiana Motorsports Association plans to develop the ability to recruit the best automotive technicians from the technical schools, in the same way that top accounting firms recruit from the best business schools.

Wages & Compensation

Wages and compensation determine the supply of workers for our critical occupations. Higher wages attract more qualified candidates in the short run, and encourage more people to become qualified in the long run. But wages are not the only factor. There are many barriers that thwart the labor market's efficiency. And, as a previous section shows, the critical occupations in EGR 5 are in competition with hundreds of other occupations.

Wages are the most obvious factor in determining the supply of workers for an occupation. If it pays wages that are significantly higher than alternatives, then the occupation will attract enough workers. If it doesn't, it won't. These statements are generally true, but they don't explain everything. Factors other than the wage differential also are important to individuals.

We have heard numerous tales of individuals changing jobs at a pay cut. One did so because she was tired of the traffic on Interstate 465 and preferred to work on the side of town where she lives. Another took a cut of \$3 an hour to get away from the sub-zero temperatures in the cold storage warehouse where he had worked. A third accepted a substantial cut in wages in exchange for the full medical benefits provided by his new employer. It is not uncommon to hear someone say, "I wouldn't work there for a million dollars!" We cannot be sure of the veracity of this statement, but it is very definitely proven that \$2 or \$3 an hour more is not always enough to draw people from one workplace to another, or from one occupation to another. Nevertheless, higher wages expands the labor supply, all things being equal, and we will apply that principle to EGR 5 in the following pages.

The second way that wages can affect the labor supply in a very mobile society is by inducing workers to ply their trade in one location rather than another. If wages for an occupation are significantly higher in one place than another, workers will be attracted there. The question is: do employers in EGR 5 pay higher wages than employers in the surrounding regions? Is there a wage advantage to working in EGR 5?

Please refer to the wage-curve charts for the targeted occupations.⁷ These are located in the following section: Occupational reports (page 36-70). Each chart compares wages in EGR 5 with those of surrounding regions. We include EGRs 4, 6, 7, 8 and 9. These five regions include 46 Indiana counties and all the areas surrounding EGR 5. These areas provide nearly 50,000 inbound commuter workers to EGR 5's nine counties.

The wage-curve charts distribute wages across a range. This provides a better understanding of the wages than the simple average.⁸ The charts show the ranges of wages paid at five points on the distribution: the 10th percentile, 25th percentile, 50th percentile, 75th percentile and 90th percentile.

EGR 5 Wages Relative to Surrounding Areas

⁷ Chemical machine operator is not included in the available wage data for the other regions. No inter-regional comparison is possible.

⁸ The 90th percentile is often twice to 10th percentile, yet both are standard wages for the same occupation. The range is a better indicator than the average or median. Average is a good statistical summary indicator when the distribution forms a bell curve or a "normal distribution." Wages are not normally distributed. The wage distribution is linear, so the average is not meaningful. Indeed, the average wage is conceivably the worst possible descriptor of wages. Consider SOC 27-2000: Entertainers and performers. This group of occupations includes impecunious dancers and musicians on one hand and highly compensated professional athletes on the other. There are few, if any, mid-range earners in this occupational group. The average of the dancer's \$20,000 annual income and the NBA star's \$2 million annual income is \$1.01 million – a number that is mathematically accurate but that distorts the picture for both actual cases in the group. This hypothetical example shows why wage ranges are better than simple averages as descriptors of occupational wages.

The data show that wages in EGR 5 are not always higher than those of the surrounding regions for particular occupations. Of the 12 occupations studied here, only one is unambiguously higher in EGR 5 than in the other regions. This is licensed practical nurses. In all other occupations, our region falls out of top place in at least one level of the wage distribution. Table 3 shows how EGR 5 ranks among the six regions. The numbers in each column show our region's rank for the specified percentile. A "1" in the "10th" column means that EGR 5 pays the highest wage to the lowest 10 percent of workers in that occupation.

Table 3
EGR 5 Wage Distribution Ranking Among Six Indiana EGRs

Occupation	10th	25th	50th	75th	90th
Registered nurses	1	1	1	1	2
Allied medical professionals	2	2	3	3	2
Licensed practical nurses	1	1	1	1	1
Nursing aides	1	1	1	2	3
Automotive service technician	2	2	1	1	1
Machinist	2	3	3	4	4
Production machine operator	6	2	1	1	1
Welder	2	2	3	3	2
Inspector, tester	1	2	2	1	1
Supervisor	1	2	2	3	2
Truck driver	2	1	1	1	2
Laborer	1	1	2	2	1

Source: *egr4_estimates.xls* datasheet, *egr5_estimates.xls* datasheet, *egr6_estimates.xls* datasheet, *egr7_estimates.xls* datasheet, *egr8_estimates.xls* datasheet, *egr9_estimates.xls* datasheet. IPIC computation.

EGR 5 does not always pay higher wages than the surrounding regions. But it usually does. Each of the neighboring regions is found to pay a higher wage than EGR 5 somewhere, but none consistently outbids central Indiana. The greatest competition comes from EGR 9, which is higher than EGR 5 at 13 points in the wage distributions. Wages in EGR 6 and EGR 8 exceed our region 10 times each.

EGR 5 relies on inbound commuters for a substantial share of its total workforce. Our ability to attract more workers to fill the current and projected shortfalls depends in part on our ability to attract inbound workers.

Rational commuter decisions

There are no certain data as to the wage that is sufficient to attract workers from the outer bounds of the commuting zone. Tens of thousands of workers do enter EGR 5 from the surrounding regions, but many more do not. So the question is: what wage would be enough to eliminate the skill shortages in EGR 5 by increased commuting?

It is possible to build a model that suggests how much would suffice if workers were rational about their decision. If EGR 5 offers employment at a rate that is higher than the cost of commuting, then rational workers should be willing to take a job in our nine-county area even if a similar job is available closer to home.

Let us assume that a prospective worker lives 50 miles from the job. His daily driving cost will be about \$8.⁹ The extra time spent driving to and from work also has a cost – equal to one hour of wages. Table 4 shows a schedule of wage increments that would be enough to attract a rational worker from a distant

⁹ Assuming gasoline costs \$2 a gallon and the fuel efficiency of his car is 25 miles a gallon.

location to pass up a local opportunity and commute to work in EGR 5. For example, a worker who could earn \$15 an hour in his home county would require at least \$2.88 an hour more to work in EGR 5 instead. This required increment would increase to \$4.75 for a worker who could earn \$30 in her local labor market.

Table 4
Hourly Increment Required for Commuter Attraction

Hourly Wage Rate	Hourly Increment Required to Attract a Rational Commuter
\$10	\$2.25
\$15	\$2.88
\$20	\$3.50
\$25	\$4.13
\$30	\$4.75
\$35	\$5.38
\$40	\$6.00

Source: IPIC computation

The wage-curve data for each occupation show that EGR 5 employers rarely offer wage premiums of the magnitudes shown in table 4. They pay competitive wages, and often the best wages among the regions. Yet they seldom pay the large premiums shown to be necessary to attract rational workers.

Attractions of scale

EGR 5 has more jobs than the less-heavily populated regions around it. The sheer number of jobs may help explain the current rate of in-migration. Chart 7 compares the number of EGR 5 jobs to those of the separate regions surrounding it. For every occupation, the EGR 5 employment value is larger than any of the other regions.

Chart 7
EGR 5 vs. Surrounding Regions Employment for Critical Occupations

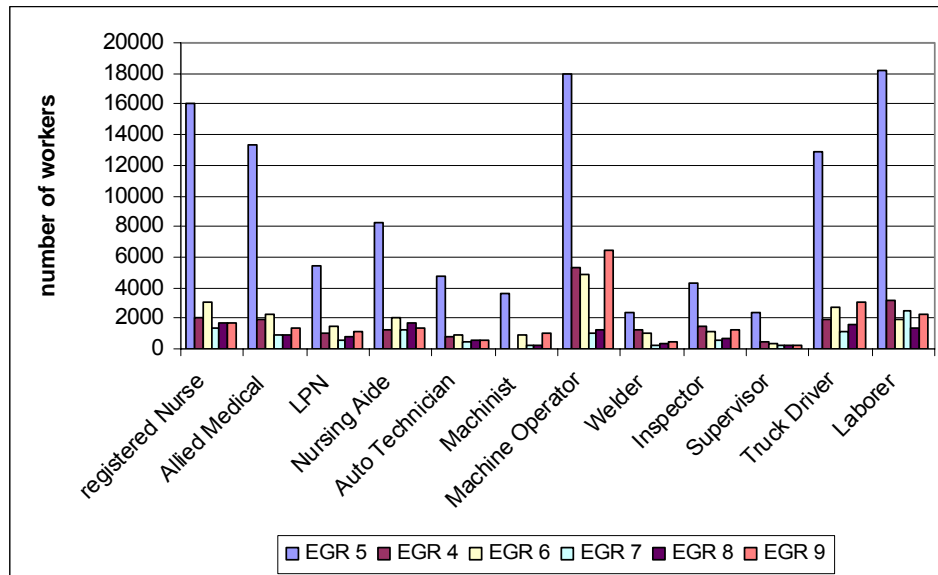


Chart 7 shows that there are many more jobs in EGR 5 than in the surrounding regions. The region employs about as many workers as all the surrounding regions combined. The number of openings is a function of total employment, so the larger region has more openings. A worker who lives in any of the outlying regions can expand the field of opportunity by looking for work in EGR 5.

Consider the case of a registered nurse living in EGR 7, which lies west of EGR 5. Within her region are about 1,300 nursing jobs. By expanding her job search northward to region 4 and southward to region 8, the number of jobs is increased by about 400 percent to 5,030. The number of openings would increase in proportion to total jobs. But if that nurse looks to EGR 5, the number of jobs expands by more than 1,000 percent. Thus, any worker who is willing to commute will be drawn toward EGR 5, as long as the wages are not a disincentive.

"It is the nature of our business that we can only offer 25 hours per week. But we offer good pay and outstanding benefits. A lot of people work for us because they want the health coverage and the tuition reimbursement."

Joe Trimpe
Federal Express

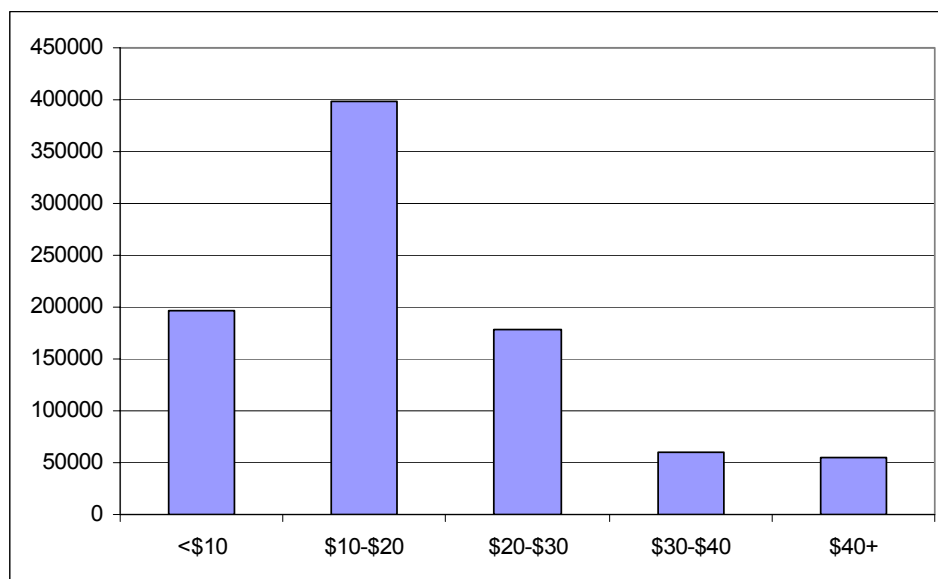
This section has shown that, for most of the critical occupations, wages do not provide a strong incentive for workers to commute into EGR 5 or to migrate here. On the other hand, the large number of opportunities here, relative to the opportunities in the surrounding regions, probably draws workers who are willing to commute or migrate.

EGR 5 Wages: Targeted Occupations vs. All Occupations

The foregoing section compares wages for the same occupation in EGR 5 and in the surrounding parts of Indiana. This section shows how the targeted occupations fit in the total wage distribution of the region. Do the targeted occupations pay premium wages? Are the wages paid for the targeted occupations among the best available to workers who possess a particular level of education, training and experience?

Chart 8 shows the overall distribution of wages for EGR 5 in \$10 wage increments.¹⁰ The chart shows a “normal” distribution of wages, peaking at the \$10-\$20 range. The distribution has a high-end tail of earners making \$30-\$40 and more than \$40.

Chart 8
EGR 5 Wages, by Hourly Wage Class

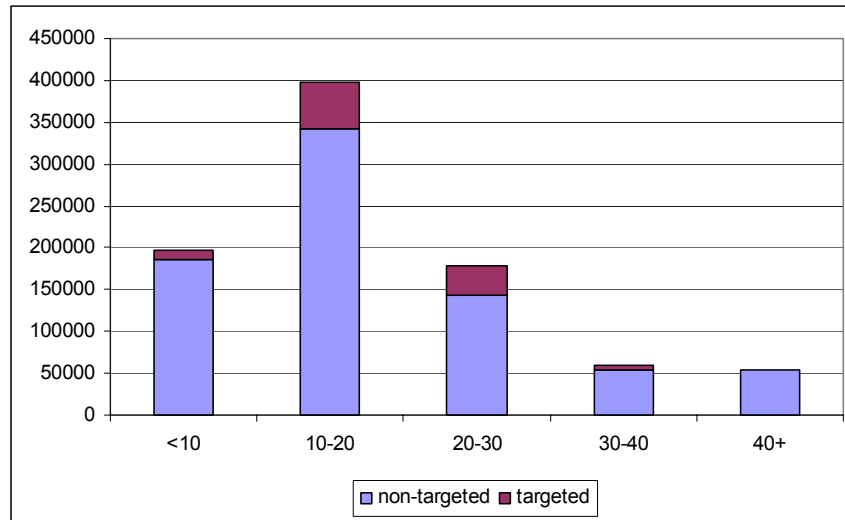


Source: IPIC computation based on egr5_wage_data.xls datasheet. Additional wage range estimates for occupations not included in the data sheet derived from Survey and Analysis of Teacher Salary Trends 2004, American Federation of Teachers, 2005.

Where do the critical occupations lie in this wage distribution? That is shown in Chart 9. Most of the jobs in the critical occupations lie in the \$10-\$20 and \$20-\$30 hourly wage brackets.

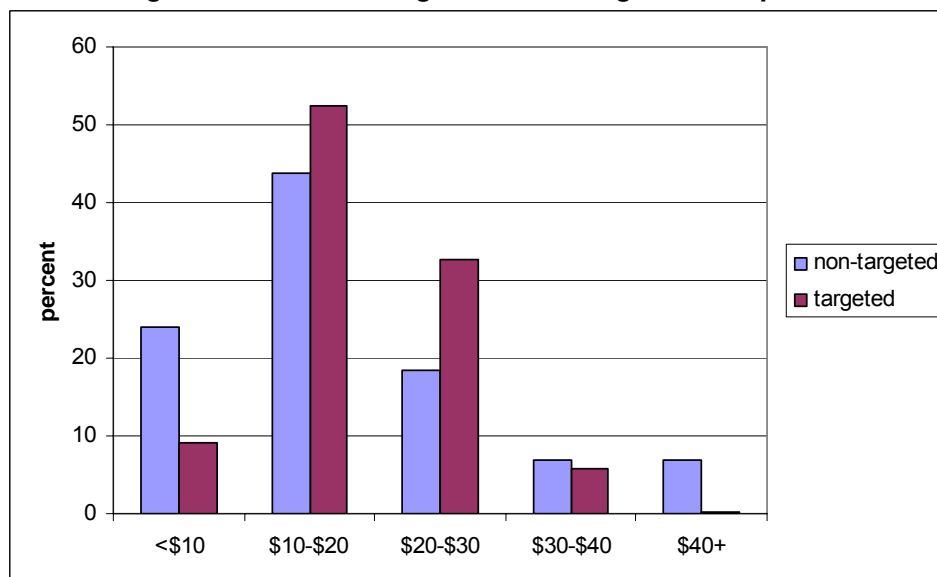
¹⁰ Chart 8 was created by distributing the employment for each occupation in the region (not only the 13 targeted occupations) into the five wage classes shown above. The decile and quartile data provided in *egr5_wage_data.xls* were used. We have computed what share of an occupation should fall in each of five classes: less than \$10; \$10 to \$19.99; \$20 to \$29.99; \$30 to \$39.99; and \$40 and more. Many occupations fit entirely in one class. Surgeons, for example, all earn more than \$40 an hour; lifeguards all earn less than \$10 an hour. The majority of occupations, however, are spread across two or three wage classes. After each occupation was distributed across the wage classes, the totals for each class were summed.

Chart 9
Critical Occupations in EGR 5 Wages, by Hourly Wage Class



The targeted occupations account for about 20 percent of all jobs in the \$20-\$30 wage bracket; 14 percent of those in the \$10-\$20 bracket; and smaller shares of the other brackets. The targeted occupations have a higher wage balance than the overall wage distribution. Chart 10 compares the percentage of workers in targeted occupations in each wage bracket with the distribution of workers in the non-targeted occupations. It shows that 32 percent of workers in non-targeted occupations make \$20 an hour or above, while 38 percent of workers in the targeted occupations do so.

Chart 10
Wage Distribution of Targeted & Non-targeted Occupations



Eliminating the shortages in the critical occupations will benefit the overall wage distribution of the region. Not all the targeted occupations pay above-average wages, and almost none are in the very high bracket of more than \$40 an hour. But the targeted occupations represent a mix of jobs for all kinds of workers while still promising an overall upward shift in earnings when compared with the distribution of jobs and wages that exists in EGR 5.

Wage distributions by industry

We now move on to the distribution of wages for the particular critical occupations. Another way of answering this wage comparison question is by determining if a job pays a comparable wage to what a similarly educated person could earn or if it adequately compensates the workers for any unusual levels of stress or exertion. This important question is discussed here in general terms and answered for each occupation separately in the individual occupational pages.

The wage distribution within the occupation affects workers' willingness to enter an occupation and stay there. If the wages are low overall, then the supply of workers to that occupation will be limited to the unskilled and unambitious workers who have no higher aspirations or cannot qualify for better work.

The disparity of wages among employers within the region is very important. Even if an adequate pool of workers is available to fill all positions in an occupation, employers offering no better than the regional average wage may not get enough workers.

Chart 11 shows the distribution of wages for workers in the four health care occupations. Following are three other charts illustrating the wage distributions for advanced manufacturing, automotive and logistics occupations.

Chart 11
Wage Distribution of Health Care Occupations

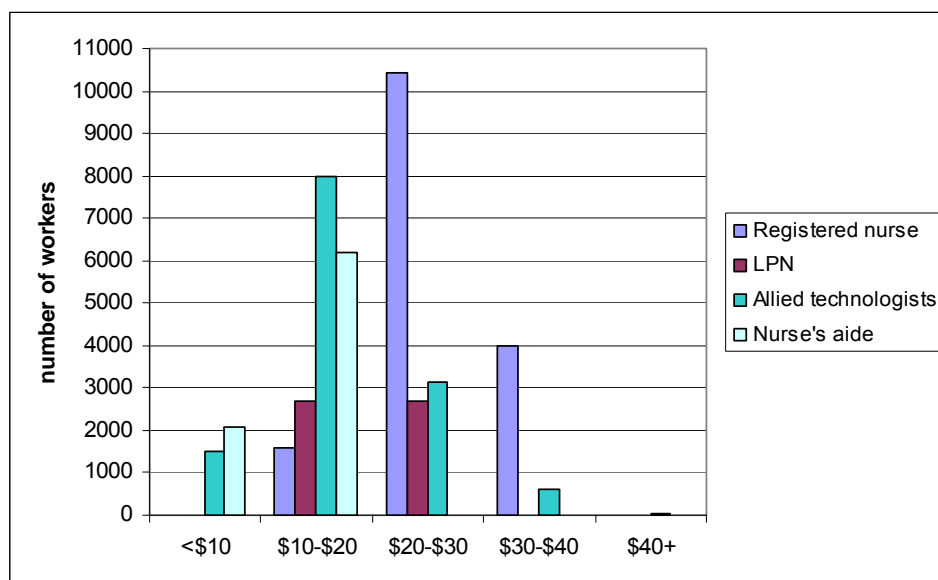


Chart 12
Wage Distribution of Advanced Manufacturing Occupations

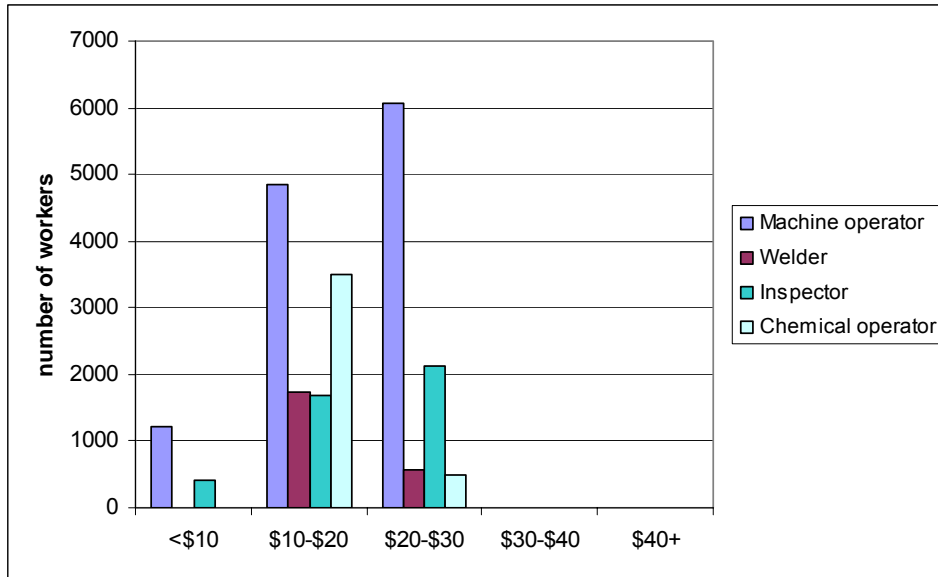


Chart 13
Wage Distribution of Automotive and Motor Sports Occupations

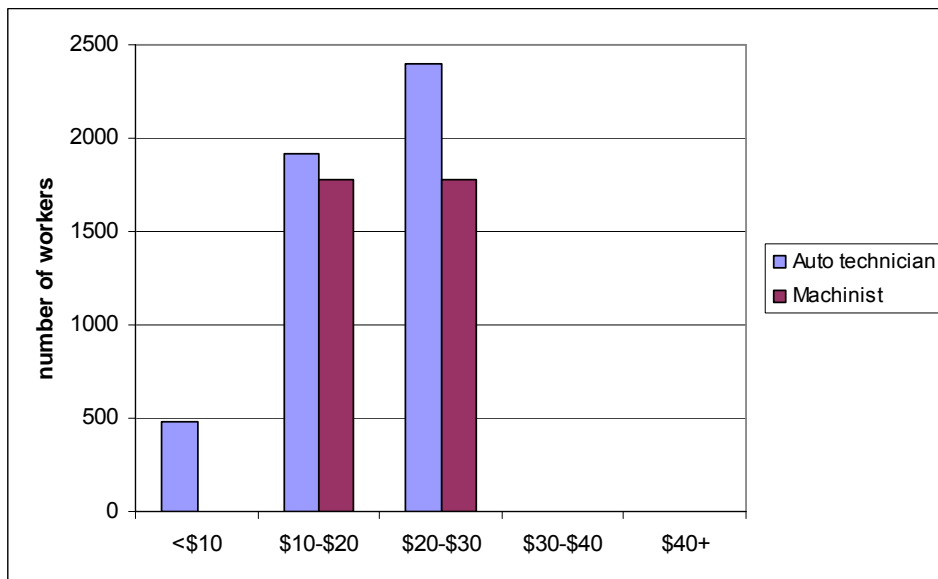
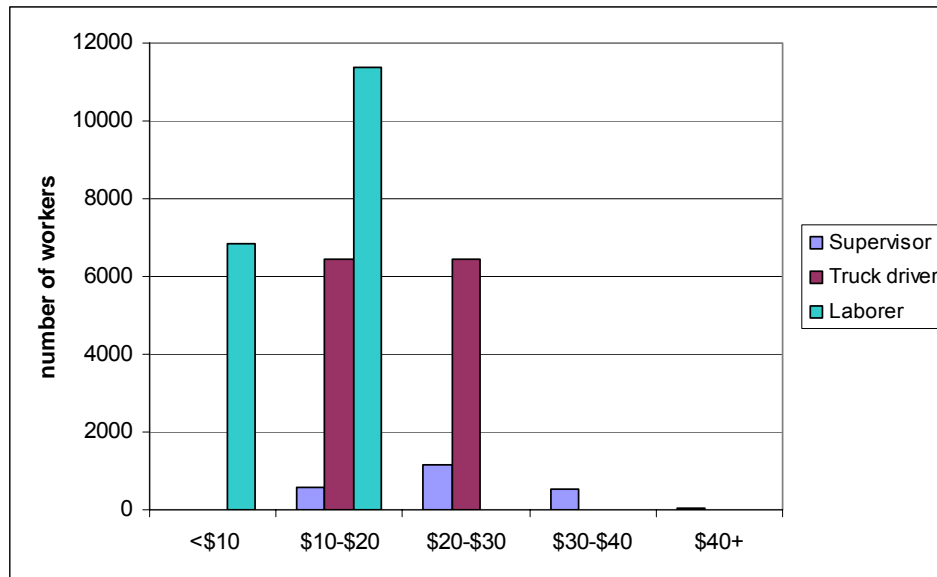


Chart 14
Wage Distribution of Logistics Occupations



Analysis of industry wage distributions

The four wage brackets used in charts 8 through 14 roughly represent four socioeconomic conditions. The first bracket, “less than \$10,” represents a poverty wage. Individuals earning less than \$10 an hour cannot maintain a household or even sustain their personal needs without subsidy from a parent or the state. Such positions are unrewarding and few workers remain in them for long periods.

The “\$10 to \$20” bracket is more rewarding. Workers earning within this range have the ability to be self-sufficient for their persons, as well as the ability to sustain a household. Of course, those earning at the low end of the range will not be self-sufficient. A full-time worker earning \$20 an hour will have an annual income of \$40,000, which is higher than the statewide average income.

The third wage bracket, “\$20 to \$30,” represents jobs with better-than-average wages. Such wage earners should be self-sufficient. The next higher categories lead from sufficiency to affluence.

We observe three kinds of distributions among the occupations. Some occupations have more jobs at lower brackets than at the higher brackets. Others have more jobs at higher brackets. The former we define as a “negative” distribution and the latter as a “positive” distribution. The third kind of distribution is either flat across two or more brackets, or bell-shaped. A bell curve or “normal” distribution will have the greatest number of jobs in the middle, with lesser numbers of jobs in both lower and higher brackets.

To make the results clearer, Table 5 summarizes the four preceding charts in one table. For each occupation, a type of distribution is given, based on the shape of the distribution as it appears in the charts. The meaning of these four types is discussed above. In addition, the wage bracket that captures the greatest share of all jobs in each occupation is listed.

Table 5
Type of Distribution for Critical Occupations

Occupation	Type of Distribution	Majority Bracket
Registered nurse	Normal	\$20-\$30
Licensed practical nurse	Flat	10—30 ¹¹
Allied medical professionals	Normal	10-20
Nursing aides	Positive	10-20
Automotive service technician	Positive	20-30
Machinist	Flat	10—30
Machine operator	Positive	20-30
Welder	Negative	10-20
Inspector, tester	Positive	20-30
Chemical machine operator	Negative	10-20
Supervisor	Normal	20-30
Truck driver	Flat	10—30
Laborer	Positive	10-20

The table shows that five of the occupations (nursing aides, automotive service technicians, machine operators, inspectors and testers, and warehouse laborers) have positive distributions. We assume that the wage distribution exerts a favorable influence on workers in these occupations, since the greatest number of workers fall into the higher bracket of the distribution. To the extent that workers judge their satisfaction in terms of their relative earnings, the majority of workers in occupations with positive distributions will be satisfied.

Six occupations (registered nurse, licensed practical nurse, allied medical professionals, machinist, supervisor or transportation workers, and truck driver) are either flat or normal. These are occupations wherein the distribution is either bell-shaped or shared equally by two or more wage brackets. Under these conditions, a share of workers, but not a majority, will be content with their wages, insofar as they judge them against other workers in the occupation.

Only two occupations have negative distributions of wages. These are welder and chemical machine operator. These two occupations offer fewer positions in the \$20-\$30 bracket than machine operator or inspector, which are similar jobs. Since welders and chemical machine operators receive comparatively lower wages, we assume that this may lead to dissatisfaction with the occupation – insofar as the workers derive their satisfaction from relative wages. If knowing that most other workers doing similar work are earning substantially more causes a worker to be dissatisfied, then it is possible that a majority of workers in these two occupations will be dissatisfied.

¹¹ The “em” dash is used for the flat distributions to indicate that the distribution crosses two wage brackets, and that there is no majority in either the \$10-\$20 bracket or the \$20-\$30 bracket.

Educational Capacity

This section asks whether the schools, colleges and training resources in EGR 5 are sufficient. Several of the critical occupations require postsecondary degrees or certificates, and the supply of qualified workers is constrained by the ability of the schools and institutions to graduate enough workers.

Educational capacity is not simply the number of degrees and certificates awarded during a period of time. Those figures are available, but they do not provide an accurate measure of capacity. Empty seats are available in many classrooms. Qualified lecturers are available and willing to teach more classes. For these and other reasons, most schools do not operate at full capacity. The number of graduates from a given class or program could increase with no additional expense or effort at all.

But “taking up the slack” by filling seats is just the beginning of educational capacity. Most educational institutions have flexibility to expand course offerings as student demand increases. Many high schools offer advanced placement courses, but only if a sufficient number of students register for the class in a given semester. Such a school has the capacity for teaching advanced placement calculus, but will graduate no students at all if none register. At the college level, too, the capacity may far exceed the number of graduates in a given year. As the head of one engineering school puts it, “We could do a lot to fill the gap. We just don’t get very many students.”

When classrooms are filled and instructors are teaching as many classes as possible, a program is near its true capacity. Further expansion is only possible if resources and facilities are refit to meet the demand. Ivy Tech Community College of Indiana is especially flexible in this sense. Ivy Tech can respond to employer demand by developing new courses that fit into approved degree programs, or by designing and offering stand-alone courses. This capacity is found in the office of Corporate and Continuing Education. This office is responsible for the R.N. Refresher Course offered by Ivy Tech-Central Indiana. This program enables former RNs to renew their license through self-directed, computer-based study and a 16-day clinical experience. A second example of Ivy Tech’s flexibility is the developing motor sports program.

The consensus of central Indiana employers interviewed for this report is that Ivy Tech satisfies the need for worker training. Most said their employees had participated in pre-designed courses rather than courses designed especially for the company.

Ivy Tech is the largest player in postsecondary education in our region for the 13 critical occupations. But there are several others. Lincoln Technical Institute and ITT Technical Institute graduate larger numbers of automotive specialists. Marian College has a large nursing program. Each of these has flexibility.

The educational capacity is deficient in one area: nurses and medical professionals. This theme was sounded repeatedly and discussed at length by the consortium. The details are discussed later in the pages devoted to each occupation, but a brief explanation is appropriate here. There are too few instructors for the nursing programs. Qualified instructors for nursing education, and for the allied medical professions, must have at least a Master of Science in Nursing degree. Many must have a Ph.D. in a medical specialty. Central Indiana has many such individuals. But few of them are willing to teach, because instructors earn as much as \$15,000 a year less than they can earn in medical practice. The postsecondary institutions have pay schedules, and the amounts they are authorized to offer is not sufficient to attract enough instructors. In addition to the bottleneck in the medical studies classroom, there also is a bottleneck in the clinical phase.

“Hospitals are subject to the market. The wages they offer to nurses and other staff rise until the demand is satisfied. Education is different. The wages that are offered to qualified nursing instructors are not determined by the market, and so we have a shortage of instructors.”

Bob Morr
Indiana Hospital & Health Assoc.

Barriers to training

For some occupations, significant barriers to entry prevent interested persons from enrolling in training. People interested in obtaining a commercial driver's license to operate heavy trucks must meet several qualifications. They must be able to lift objects weighing up to 70 pounds, speak English and have normal blood pressure. Many drivers of hazardous materials or controlled substances must pass a background check by the Federal Bureau of Investigation. Each of these requirements promotes safety, but they limit the pool of applicants for truck driver training.

The Pipeline

The pipeline refers to the flow of individuals through the necessary preliminaries that lead to an occupation. These preliminaries include education and training, certification or licensing and experience. For some occupations, the pipeline is defined by law or regulation. In industries where there are no specific rules, industry practices determine the pipeline. The general labor supply is discussed first. Later, the report considers the career planning of young people.

Characteristics of the Available Workforce

EGR 5 has more than 44,000 unemployed people. Economic theory suggests that the labor market should match the idle workers to the vacant jobs. But the chronic skill shortages show that the market does not function optimally. The labor market is not efficient because the unemployed workers do not have the skills or other necessary qualities to do the jobs that are vacant. Alternatively, the jobs do not pay well enough to appeal to the workers.

We were fortunate that relevant research had been performed recently in our area. The study was commissioned by the Indy Partnership and issued in August 2005.¹² This study describes available workers, including the unemployed and the underemployed. This latter group consists of workers who are working but would like to move to a new position at higher pay and/or different work conditions. Since the prevalent hiring strategy of most companies is to lure current workers from other jobs rather than recruit from the unemployed, it is especially important to consider the underemployed.

EGR 5 Available Labor Pool

Total available	173,800
Unemployed	44,600
Underemployed	106,900
Potential re-entrants	22,300

The report, prepared by The Pathfinders, shows that the region (EGR 5 plus Monroe and Tippecanoe counties) has 173,800 available workers. These include three sorts of people. The first is the unemployed, of whom there are about 44,600 in the region. These numbers disclosed in the report match the most recent unemployment figures for the counties of EGR 5 as reported by the Local Area Unemployment Statistics. In addition to the unemployed, there are about 106,900 underemployed people. These are people who are working at a job but would move to a better job if it were available. These people may be working part time but prefer full-time work, or they may have skills that are not used in their current job. The methodology of the report determined whether people were realistically underemployed or simply wishing for a better job. The third category of workers in the study are people who are not employed and not looking, but who could be attracted back into the labor market by the right conditions. There are about 22,300 of these in the region.

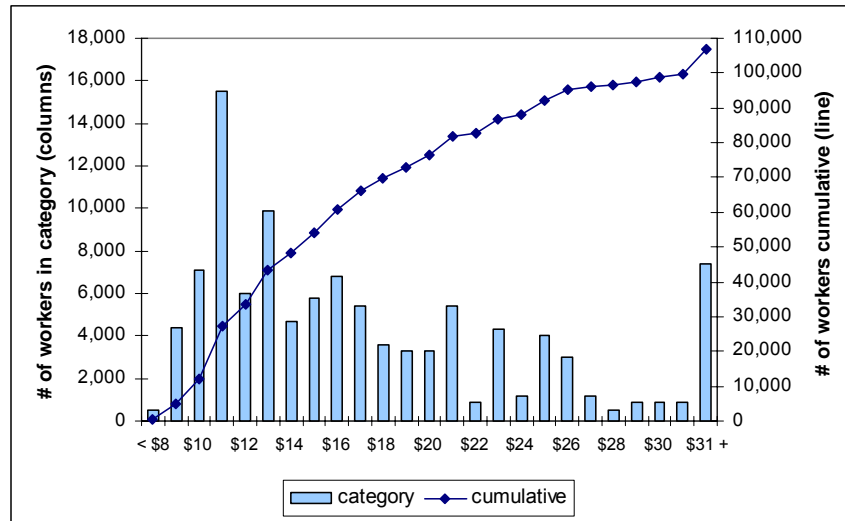
Underemployed Labor Supply

More than 106,000 workers in the region indicated they would change jobs. Not all the available workers are dreaming of premium wages. Chart 15 below shows the distribution of the 106,900 underemployed workers by the wage that they said would be enough to compel them to change.¹³

¹² *The Indianapolis, Indiana, Area Labor Availability Report*, compiled and prepared by The Pathfinders, Dallas, Texas, August 2005.

¹³ The blue columns in the chart are labeled "category" and indicate the number of people surveyed who said they would change jobs if offered a specific hourly wage. The scale is on the left side of the chart. The line indicates the cumulative number of underemployed and available workers. The number reaches to 106,900 and is scaled on the right axis.

Chart 15
Available Underemployed Workers, by Wage Bracket

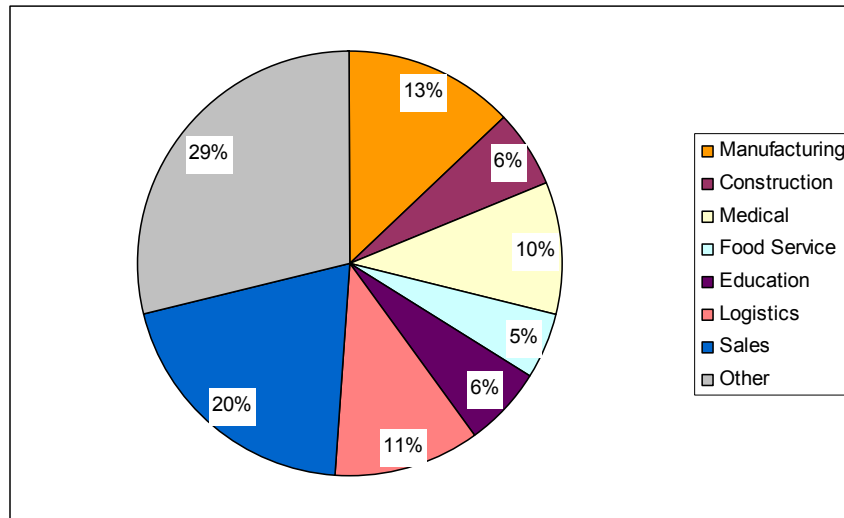


Source: *The Pathfinders*

The chart shows that the majority of workers are willing to take new jobs in the \$10-\$20-an-hour wage bracket. Indeed, the largest response was from workers willing to take a new position if they were offered between \$10 and \$10.99 an hour. The survey was balanced to ensure that every wage group was represented in proportion to its size in the labor market. The greater numbers of willing workers at the low end are not an accident of the survey, but an actual reflection of labor market conditions. Workers at the low end of the wage scale are more willing to change than are those at the high end.

The number of underemployed workers available would be adequate to meet the shortages in our critical occupations. Next we must consider whether those available workers have the necessary skills to step into the vacancies. Chart 16 indicates the sector in which the underemployed and available workers are employed.

Chart 16
Current Employment of Underemployed Workers



Source: *The Pathfinders*

This chart does not assure us that the underemployed and available workers have experience and qualifications to work in the critical occupations. Some of the occupations (particularly those in the health care and automotive industries) have very specialized training and skill requirements that are rare even within the industry.

Unemployed Labor Supply

Current data from the LAUS data series confirm that there are about 44,000 unemployed in EGR 5. Although the Pathfinders report looks at a different area, the findings are useful in describing and understanding the unemployed labor supply. The following facts emerge from the survey:

- 25 percent are laid off from their job
- 28 percent lost employment due to cutbacks
- 28 percent have postsecondary education
- 43 is the average age of the unemployed

Duration of Unemployment

Less than 5 weeks	36.1 %
5 to 14 weeks	30.4 %
15 to 26 weeks	14.0 %
27 weeks and longer	19.5 %

Source: *Bureau of Labor Statistics*

The unemployed labor force is very fluid. Although the number of unemployed may exceed 40,000 for many consecutive months, this does not mean that the same people remain unemployed. Most of the unemployed are off the rolls in less than 15 weeks, as shown in sidebar table "Duration of Unemployment." Half of all unemployed persons nationwide find work again in less than nine weeks. This confirms that the unemployed are by no means a uniformly hopeless class of people. They have skills that have been used on real jobs in the recent past, and most of them will go back to work within two months or less. The chronic, long-term unemployed cohort is less than 20 percent of all unemployed, or about 8,800 people in EGR 5.

Labor Force Re-entrants

A third group of potential workers worthy of consideration is the re-entrants. These are not working and not looking for work, but would re-enter the labor force if certain conditions were met. The Pathfinders report tells us that there are 22,300 potential re-entrants in central Indiana. Most are female, and their skills and experience are strong in health care. They are older and less educated than the underemployed class described above. Pathfinders' survey shows that the wage demands of re-entrants can be met at low levels. Twenty-five percent of those surveyed who said they would come back to work indicated they would take \$8.99 an hour or less. Seventy-five percent of all re-entrants would come back to work for \$15.42 an hour or less.

Money income, however, is not the only consideration. Survey respondents rated five factors to be "extremely important" in their consideration to re-enter the labor force or to change jobs. These five factors were:

- insurance benefits
- financial stability of the company
- retirement benefits
- salary
- opportunity for advancement.

A large number of experienced workers live in EGR 5 and are willing to re-enter the labor force. Their expectations are not unreasonable, either in terms of wages or in terms of job conditions. This finding, taken alone, suggests that we do not have a genuine labor shortage, but simply a poorly functioning labor market where people do not know about the opportunities available to them.

Demographic shifts

The aging of the baby-boom generation and the eventual retirement of that cohort present another major issue affecting the labor market. Conventional wisdom says the aging of the U.S. population will have two effects. The first is a decline in the working age cohort, which includes persons between the ages of 25 and 55. U.S. demographic trends suggest that the number of people between those ages will fall beginning about 2012 and continue to fall until about 2040. The drop in the number of people in the working-age cohort suggests a paucity of workers for all kinds of jobs throughout the country. Aggravating this shortage even further, the then-retired baby boomers will demand more health and retirement services than have ever been required in the past.

Demographic projections from the Indiana Business Research Center show that these trends will affect EGR 5, but that the effects may be slower to arrive and milder than in other parts of the state and nation. Vince Thompson, economic research analyst at the IBRC, says the working age cohort (adults between the ages of 25 and 55) already may have peaked for the state

"The number of adults in central Indiana keeps growing, but adults in their prime working years will be a smaller share of the total population."

Vince Thompson
Indiana Business Research Center

of Indiana, but will continue to grow in EGR 5. The demographic projections provided by IBRC show that Indiana's working-age cohort is 2.6 million in 2005. That number represents 42.4 percent of Indiana's total population. The projections show that number declining to 2.5 million by 2020. At that time, working-age adults will be only 37.9 percent of the state's population. By contrast, the working-age cohort in EGR 5 is expected to continue growing from its current 777,352 to 808,924 in 2020 and 814,079 by 2040.

Thompson stresses that the cohort will diminish as a share of the total population in EGR 5 as it will elsewhere. Chart 17 illustrates the decline in working-age adults in the coming years.

Chart 17
Working-age cohorts as percentage of population, Indiana and EGR 5

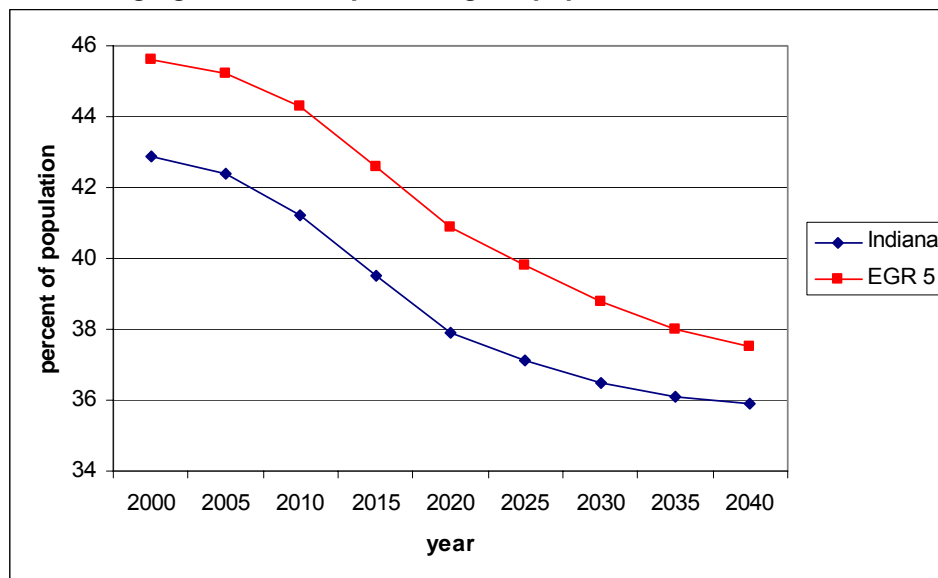


Chart 17 shows that EGR 5 will maintain its advantage over the rest of Indiana. Adults in their prime working years will be a larger share of total population in our region than across the state. EGR 5 will have a similar advantage over many, but not all, of the states.

The second trend – greater demand for health care and retirement services by the large retiree cohort – will affect EGR 5 as well as the rest of Indiana and the United States. People age 55 and older will increase from 19.1 percent of the region to 32.5 percent by 2040.

Career planning

For some occupations, the pipeline is very short. For others, several steps may be involved. Medical doctors, for instance, must obtain a medical degree, obtain a license and perform a required period of residency before they can begin to practice.

In this section, we find that the pipeline is a serious detriment for our region's advanced manufacturing and logistics employers. Both industries offer thousands of jobs that pay well and are rewarding. The jobs also require smart or skilled people. But the pipeline is empty. High school students simply do not consider these industries as a probable career goal.

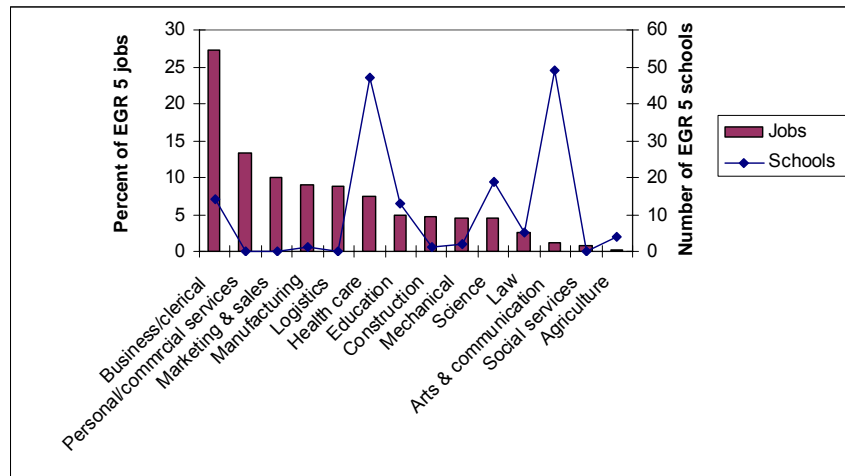
"We're not getting to the high schools. We just don't get anyone coming straight from school at all."

Bob Francis
Mitsubishi Heavy Industries

The Learn More Research Center Web site lists the top three career choices of high school juniors at each Indiana school. The results of this survey indicate the mouth of the pipeline for future workers in each industry. Chart 17 compares the jobs in EGR 5 with the interest that students show in those jobs. The chart shows a serious mismatch between students' interests and the actual job market.

Chart 17

11th-grade career choices vs. U.S. jobs



Source: Learn More Indiana Resource Center

Students responding to the survey evinced an interest in only five occupational clusters. Every one of the 51 high schools reporting listed “arts, audio-visual technology and communications” as a top choice. This career cluster represents 1.1 percent of jobs in the region, but 20 percent of students expect to work in this cluster. A second top choice – given at 49 of 51 schools – was “health care.” The health care industry is one of the area’s largest, but the health care professions (doctors, nurses and medical technicians) represent only about 7.5 percent of all jobs.

At the other end of the student-interest scale, a single school – Eminence High School in Morgan County -- listed manufacturing production as a top-three career choice. Manufacturing production, along with personal services, marketing and sales, and logistics, garnered negligible interest among students. Considering that manufacturing production jobs pay some of the best overall wages, it is stunning that students do not view manufacturing as a desirable career choice.

This problem has been addressed by the National Association of Manufacturers in a series of reports:

Research has shown a direct relationship between manufacturing’s negative image – which is tied to the old stereotype of the assembly line – and the decreasing number of young people pursuing careers in the industry.¹⁴

The five critical manufacturing production occupations in EGR 5 all are affected by the low interest in production jobs. The same is true for logistics.

The skill shortage for the majority of EGR 5’s critical occupations is not caused by a lack of people. It is simply that many people overlook opportunity in these occupations when they plan their short- and long-term career changes. National Association of Manufacturers President John Engler, quoted at right, ignores this key aspect:

“The young people coming out of our schools today don’t have the science, math, critical thinking and technical skills they need [to perform well in advanced manufacturing.]”

John Engler
National Assoc. of Manufacturers

Manufacturing’s problem is not that young people are not learning the necessary skills. Many are. Manufacturing’s problem is that the young people who are learning the essential skills do not seek careers in manufacturing.

¹⁴ 2005 Skills Gap Report – A Survey of the American Manufacturing Workforce, Deloitte and The Manufacturing Institute, 2005, p. 2.

Brain Drain

Indiana prides itself on having outstanding universities. Current and previous gubernatorial administrations have formulated policies to make Indiana part of the leading-edge information economy. Indiana's universities are nationally prominent. Indiana would rank among the best-educated states in the United States if its achievements were commensurate with the reputations of its public and private universities and the goals of its leaders.

But Indiana's population doesn't reflect these achievements and priorities. Indiana ranks very low among the states (47th in 2004) in the percentage of its adult population who have college degrees.¹⁵ Indiana is in the company of Kentucky, Mississippi, Arkansas and West Virginia – none of which are reputed for their intellectual or academic strength.

Indiana's low ranking would be understandable if the state lacked capacity to provide college degrees to its citizens. But the opposite is true. Indiana ranks high (16th among the states) in college enrollment capacity. Relative to its size, Indiana churns out 19.9 percent more bachelor's degrees each year than the national rate. Yet the state remains low in the share of adults with college degrees. Indiana has stood at 47th place in the ranking of states since 1998.

"Indiana is producing larger numbers of talented graduates than many states, but the 'brain drain' has less to do with the supply of graduates than the supply of good jobs."

Martin Jischke
President, Purdue University

The most thorough research on the Indiana brain drain was performed in 1999 and 2000.¹⁶ The analysis of the Human Capital Retention Project remains the most thorough yet done.

Forty-two percent of the people who get bachelor's degrees from Indiana colleges leave the state within 18 months of graduating. Some of these are out-of-state students who return home after getting their degrees. But most are Hoosier students who grow up here, study here and then leave.

Several questions should be asked about this number. How does Indiana's 42 percent loss compare to the departure rates of other states? The answer is that no state retains all its graduates, but the others do better than Indiana. Illinois loses 18.4 percent. Kentucky loses 19.8 percent. Across the nation, states lose on average only 28.7 percent of their graduates. A high rate of mobility is common among college graduates. But Indiana loses more than any of its neighboring states.

Three distinct factors contribute to Indiana's poor retention rate. Indiana attracts lots of out-of-state students. For every Hoosier student who leaves Indiana to study, 2.2 non-Hoosiers come into the state for college. Nine out of 10 out-of-state students will leave Indiana after graduating. Next, Indiana also has a large capacity for higher education. As noted above, the state ranks 16th among the states in terms of capacity for college education. This produces a large pool of graduates, who are cherry-picked by nationwide recruiters. Indiana's employers have no advantage when it comes to recruiting Indiana college graduates. And finally, Indiana retains fewer of the people it graduates than other states.

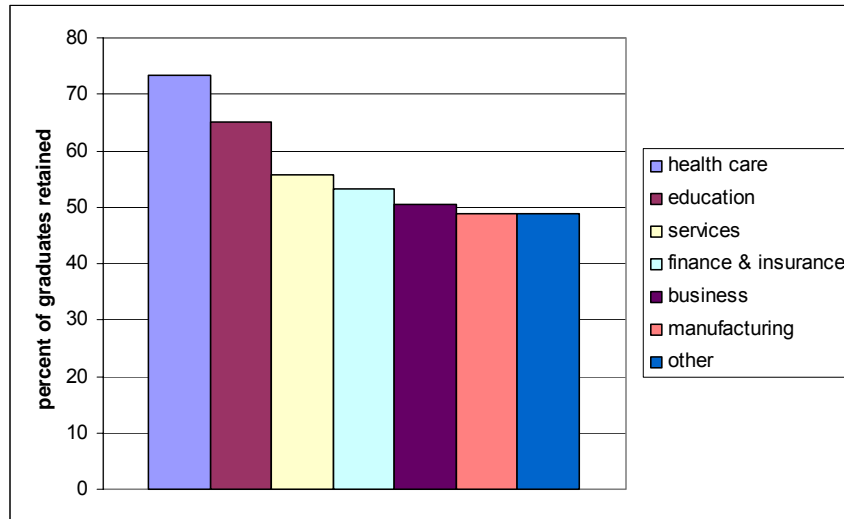
A further question is whether out-migration is greater for some programs than for others. Chart 18 answers this question. The results come from an Indiana Graduate Follow-up Survey that was performed in 1999. The data show the percentage of graduates who stayed in Indiana by the type of employment they found afterwards.

Chart 18

¹⁵ Educational Attainment Estimates, U.S. Census Bureau, 2005.

¹⁶ *Graduate Migration from Indiana's Postsecondary Institutions*, Indiana Fiscal Policy Institute and the Indiana Commission for Higher Education, March 1999.

Retention of Bachelor's Degree Recipients, by Industry of Employment

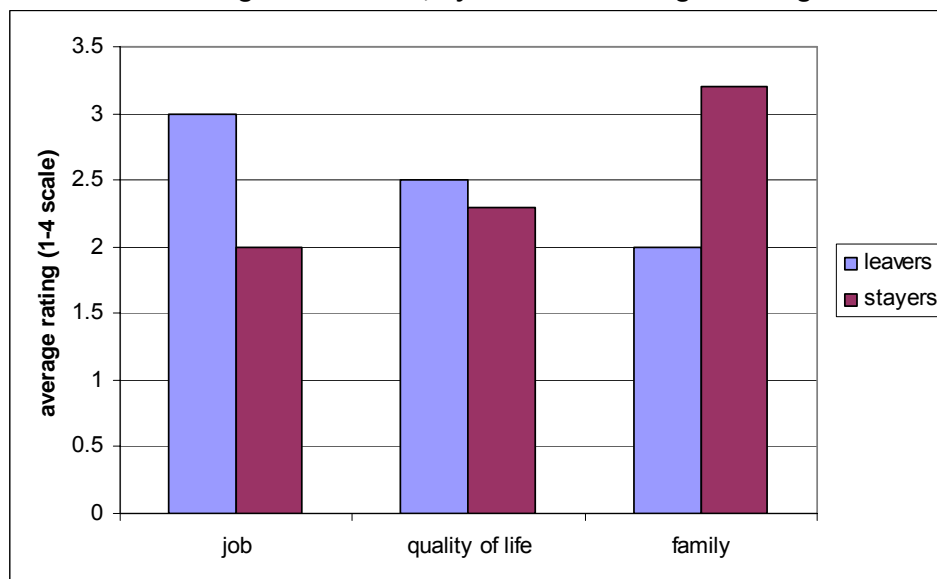


Source: Indiana Graduate Follow-up Survey

The chart shows that health care has a relatively good rate of retention rate of 73.5 percent. This appears to be better than the overall national rate at which graduates stay in the state where they receive their degree. Indiana's retention in the health care sector appears to be about average; there is no brain drain in health careers. Education ranks below the national threshold, but better than most Indiana industries. Manufacturing rates low. Fewer than half of the individuals who receive a bachelor's degree relating to manufacturing remain in the state afterward to work in an Indiana company.

Another question relating to the brain drain is, why? What are the reasons given by those who leave? The answer is provided by the Indiana Graduate Follow-up Survey. Chart 19 below shows how two distinct groups – those who left after graduating and those who stayed to work in Indiana – ranked three factors.

Chart 19
Rankings of Priorities, by residence after graduating



Source: Indiana Graduate Follow-up Survey

The chart shows that leavers and stayers have different priorities. Those who left did so because they believed they could find a better job elsewhere. Those who stayed wanted to be near their family. In short, the majority of graduates who were ambitious believed that Indiana employers could not satisfy their aspirations.

This does not mean that the respondents never perceived job opportunity in Indiana. Many who stayed gave reasons relating to job and career. But it is worth noting that those who placed the highest priority on job and career most often believed that opportunities lay outside Indiana.

Quality of life was a moderate influence on the decisions of respondents. And, of course, this points up the differences of Individuals. Some respondents indicated that they like the climate of Indiana and wish to stay to continue enjoying it. Others indicated that they do not like Indiana's weather, and so they moved. Some respondents approved of Indiana's cultural and recreational offerings, while others did not and so moved.

The brain drain is an important factor in Indiana's labor exchange. But it is not critical for the 13 critical occupations in EGR 5. Although we have no data specific to EGR 5 or to the 13 critical occupations, the information discussed here shows that the labor shortages are not a brain drain supply problem. The critical occupations mostly do not require college degrees. The exception to this assertion is health care. In that area, Indiana has a high retention rate.

Hispanic/Latino Labor Force

There are between 80,000 and 100,000 Hispanics/Latinos in Indianapolis and the surrounding counties that constitute EGR 5. This group warrants special consideration in the labor supply. Hispanics/Latinos account for only about 6 percent of the population of the region. But they constitute up to 12 percent of the labor supply for some occupations.¹⁷ The labor force participation rate for Hispanics/Latinos is much greater than for other groups. There are estimated to be only about 1,500 retired elderly Hispanics/Latinos, or less than 2 percent of all Hispanics/Latinos in the region.

Hispanics/Latinos are migrating to many regions of the United States, and EGR 5 has no particular advantages to attract them to central Indiana. There is very little information about the comparative job opportunities in various regions of the country. The cold of Midwestern winters is a definite discouragement to Mexicans and other Hispanics/Latinos.

On the other hand, Indianapolis and Indiana have established a good image among Hispanics/Latinos. The Indianapolis Mayor's Commission on Latino Affairs does, to some extent, distinguish central Indiana from other communities in the United States. Miriam Acevedo Davis of La Plaza, a coalition of four groups serving the Hispanic/Latino community in Indianapolis, says Hispanic/Latino individuals who have benefited from the city's assistance often send word to relatives in their home country that Indianapolis is a good place.

Hispanic/Latino workers have a very good reputation today among central Indiana employers – especially in logistics and manufacturing companies. They are said to have a good work ethic and to be reliable. More than half of the 500+ employees at Atlas Cold Storage, a distribution center in Shelbyville, are Hispanic/Latino. General manager Bob Grau says the company has a balanced recruiting program that uses both English and Hispanic/Latino media, but that Hispanics/Latinos have increased as a share of his workforce over the past few years. Hispanic/Latino workers tend to stay on the job, while others tend to quit. The facility is kept at very cold temperatures and many workers object to the discomfort and exertion of the job. Atlas Cold Storage is a union worksite and pays its workers, including the Hispanic/Latino employees, higher than the regional average wage.

"Hispanics come here to work. Overwhelmingly they are people who want to get a job and keep it so they can earn money."

Miriam Acevedo Davis
La Plaza, Indianapolis

"We've hired a variety of workers, but we find we get a better retention rate with the Hispanic workers."

Bob Grau
Atlas Cold Storage

Hispanic/Latino workers face two particular problems. The first is immigration status. Most Hispanics/Latinos in central Indiana do not have full authorization to work in the United States. They are here and are working, but their status is illegal. The exact number of illegals in our region is unknown, since the people who are most eager to assist them with social programs or hire them for jobs usually do not ask about their status. The solution to the immigration status issue lies with the federal Immigration and Naturalization Service.

Davis suggests that illegal status makes Hispanics/Latinos more conservative about changing jobs. "If I'm here undocumented," she says, "I'm more likely to stay in one place where I think I'm safe. If I start looking around and asking questions, I might find a place where I could earn a little more, but I might also put everything at risk."

¹⁷ Hispanic/Latino Needs in the Indianapolis Area, Center for Urban Policy and the Environment, 2005, p. 9.

The second issue for Hispanic/Latino workers is English-language competency. Many current Hispanic/Latino workers are in entry-level jobs that require little English. These include custodial work in hotels and hospitals, as well as warehousing, landscaping, manufacturing and restaurants. Davis suggests that most Hispanics/Latinos want to learn English, but would rather work than take classes. Many inner-city churches offer English classes, but the hours and locations are not convenient. Larger companies have begun hiring English teachers from La Plaza and other resources to teach workers on site and during the work shift. The English-language resources are usually very basic. They are adequate to prepare Hispanic/Latino individuals to living in the community. But they seldom contain any professional or vocational language, which is needed to help the worker function on the job.

In addition, difficulty in obtaining a driver's license without proper identification has been a discouragement to some Hispanic/Latino workers. In many situations, one licensed driver can ferry a number of others to their jobs, but there is evidence that lack of mobility is an issue for Hispanic/Latino workers. One employer cited transportation as the No. 1 problem. In all likelihood, this problem affects logistics more than other sectors, because the warehouses often are located outside the city center where the Hispanic/Latino workers live.

► Occupational Assessment of the Factors

Registered Nurse

Key Points:

- The key problem leading to shortages of registered nurses is the bottleneck in education caused by an insufficient number of nursing trainers.
- Registered nursing is a popular occupation among young people planning their futures.
- Wages in EGR 5 for registered nurses are competitive, and often the highest among contiguous regions.
- Indiana's education policies exacerbate the nursing shortage by paying less to qualified trainers than they can earn in medical practice.
- Attrition among nurses is thought to be serious by some parties, but others say that nurses who leave the occupation find other important work and continue to serve the community.

Human resources capacity	2	
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Most nurses work in hospitals. These are large businesses with sufficient capacity for recruitment and staff development. Investigation in EGR 5 shows that central Indiana employers are sophisticated and aggressive in searching for nurses. The following table shows that businesses recruiting for nurses use a wide variety of methods. The only two methods that appear to be underused are one-stop centers and recruiters. The former method is more useful for entry-level positions and is rarely effective in placing professionals. The low tendency for using recruiters is, we believe, a signal that hospitals are very serious about their nursing staff and are unwilling to outsource the task.

Occupation	Newspaper	Hire from within	Referrals	Unsolicited walk-ins	One-stop centers	School placement	Recruiters	Internet
Registered nurse	96	64	93	56	15	48	26	53

Source: *ERISS Job Vacancy Survey, 2005*

In addition to the hiring methods shown above, central Indiana has auxiliary capacity in the form of professional employer organizations that specialize in nursing and other medical occupations. Services such as Nurse Finders and others enhance the internal capacities of the hospitals to find available workers.

The second-largest employer of nurses is the ambulatory care sector. These are individual doctor's offices. These are smaller and have less capacity than the hospitals. However, these employers do not have the same urgent need for nurses. Turnover is low for ambulatory care facilities.

Wages	4	
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Experts in the field say that wage variation is one of the prime factors causing the nursing shortage. Relative to the wages of nurses in the surrounding regions, nurses in EGR 5 earn competitive wages. In fact, nursing wages in EGR 5 exceed those of all contiguous regions at all points in the wage curve, with a single exception. EGR 8 appears to pay more at the 90th percentile, but this may be due to sampling error.



The wage-related problem is that persons qualified to instruct nursing students must hold a Master of Science in Nursing degree. Those who hold such degrees may earn substantially more money in medical practice than teaching.

Educational capacity	4	
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The chief cause of the nursing shortage is too few seats in nursing programs. There also may be localized shortages in laboratory space and supervisors for clinical exercises. The Indiana Hospital & Health Association reports that, during the past year, more than 2,000 *qualified* applicants were turned away from nursing programs because no seats were available. This number is nearly equal to the statewide nursing shortage of 2,600 reported by IHHA. In other words, the bottleneck in educational capacity can be seen as the entire cause of the nursing shortage.

Pipeline	1	
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High school students are very interested in medical careers, including nursing. The number of applicants far exceeds the number of seats available.

Nursing has a short career ladder. To practice as a nurse, a person must obtain a degree and a license. Experience in other occupations counts for very little toward a nursing degree. In effect, there is only one way to nursing, and that is via college.

From the Occupational Outlook Handbook

In all states and the District of Columbia, students must graduate from an approved nursing program and pass a national licensing examination in order to obtain a nursing license. Nurses may be licensed in more than one state, either by examination, by the endorsement of a license issued by another state, or through a multi-state licensing agreement. All states require periodic renewal of licenses, which may involve continuing education.

There are three major educational paths to registered nursing: a bachelor's of science degree in nursing, an associate degree in nursing and a diploma. BSN programs, offered by colleges and universities, take about four years to complete. In 2002, 678 nursing programs offered degrees at the bachelor's level. ADN programs, offered by community and junior colleges, take about two to three years to complete. About 700 RN programs in 2002 were at the ADN level. Diploma programs, administered in hospitals, last about three years. Only a small and declining number of programs offer diplomas. Generally, licensed graduates of any of the three types of educational programs qualify for entry-level positions as staff nurses. (Source: Occupational Outlook Handbook)

Brain drain	2	
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Health-related careers are the one area wherein Indiana does not have a serious outflow of college graduates.

Hispanic/Latino workforce	3	
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Few workers from Mexico and other Central and South American countries are qualified to practice nursing in the United States. Only 3 percent of Hispanic/Latino workers are health care practitioners. Filipino nurses have been recruited in small numbers.

Allied Medical Professionals

Key Points:

- These professions are becoming increasingly important, and recently trained technicians are in high demand.
- Many current technologists need to improve their competencies.
- The greatest problem is the bottleneck in education.

Human resources capacity	1	
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Technologists and other allied health professionals work in hospitals, most of which have very sophisticated human resources programs. Even more than with nurses, human resources capacity is not a problem in the hiring of allied medical professionals.

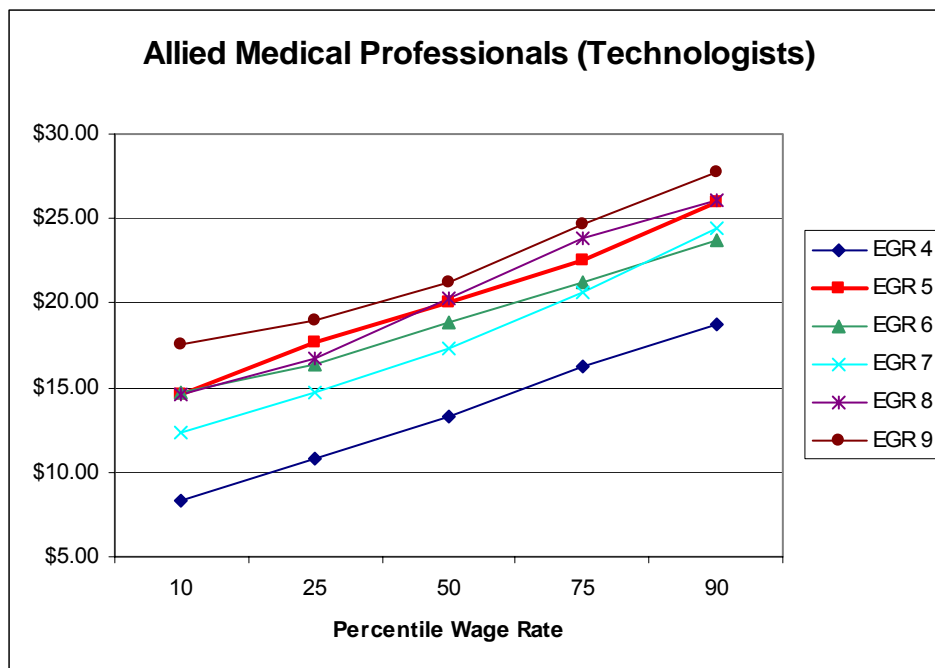
Occupation	Newspaper	Hire from within	Referrals	Unsolicited walk-ins	One-stop centers	School placement	Recruiters	Internet
Allied medical professional	17	100	100	83	0	17	17	100

Source: ERISS Job Vacancy survey, 2005.

Wages	4	
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Experts believe the first reason for the shortage in allied health professionals is the dearth of qualified instructors. Such professionals can earn thousands more dollars per year working in health care than as faculty in a medical program.

The following table shows that EGR 5 wages for allied medical professionals is competitive with wages paid in surrounding regions. Although the wages paid EGR 9 exceed our region at every point on the wage scale, EGR 5 is above the other four regions.



Educational capacity	4	
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There is a bottleneck in education. Many qualified applicants are turned away from programs. There may be small-scale shortages of laboratory capacity in some schools, but the greater issue is the number of instructors.

Pipeline	1	
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High school students throughout EGR 5 believe health care is one of the most desirable industries.

The pipeline for allied medical professions is short, consisting of relevant coursework leading to the degree and certification required to practice. These professions are, in a sense, even more restrictive than registered nurse, because a bachelor's degree is the minimum qualification required. Registered nurse has some positions for someone with only an associate's degree. The occupations that are included under the definition of allied medical professions include a few that require only associate's degrees. But even among these there is no ladder. There is no substitute in these professions for the required and relevant education and certification.

From the Occupational Outlook Handbook

The usual requirement for an entry-level position as a clinical laboratory technologist is a bachelor's degree with a major in medical technology or in one of the life sciences, although it is possible to qualify through a combination of education and on-the-job or specialized training. Universities and hospitals offer medical technology programs.

Bachelor's degree programs in medical technology include courses in chemistry, biological sciences, microbiology, mathematics and statistics, as well as specialized courses devoted to knowledge and skills used in the clinical laboratory. Many programs also offer or require courses in management, business and

computer applications. The Clinical Laboratory Improvement Act requires technologists who perform highly complex tests to have at least an associate degree. (Source: Occupational Outlook Handbook)

Brain drain	2	
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Indiana has a serious brain drain overall, but research shows that it is not serious for the health care professions.

Hispanic/Latino workforce	2	
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Only 3 percent of Hispanic/Latino workers are health care practitioners.

Licensed Practical Nurse

Key Points:

- There is a strong interest in the occupation among students.
- Colleges are not able to serve all interested applicants.
- Nursing instructors are hard to find.
- LPNs in EGR 5 earn better wages than those neighboring regions.

Human resources capacity	2	
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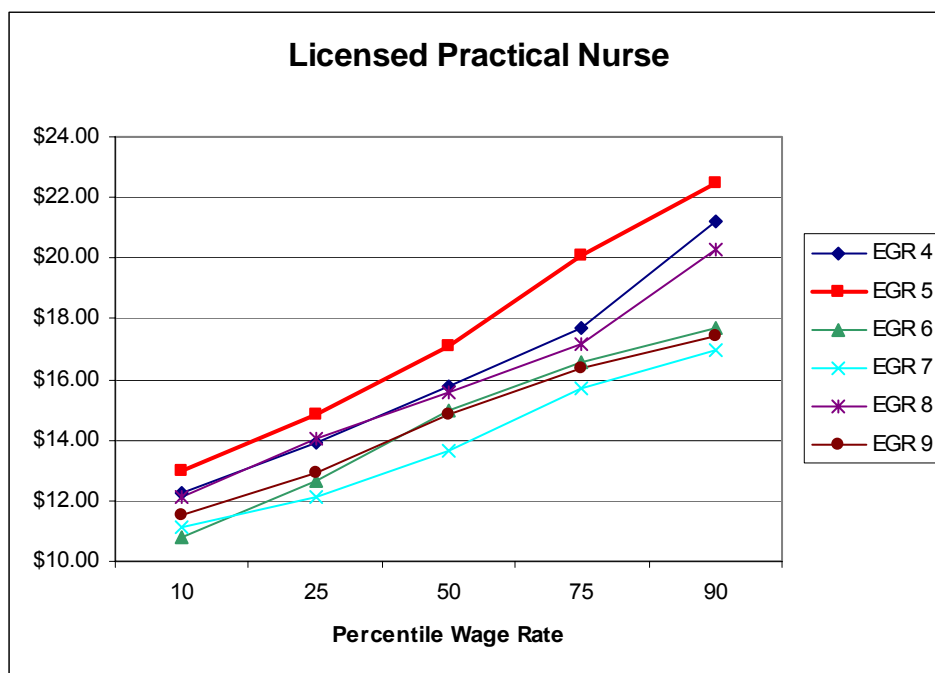
Licensed practical nurses are used almost exclusively in large institutions where HR capacity is fully developed. The following table shows that a wide variety of methods are used by employers to find qualified LPNs.

Occupation	Newspaper	Hire from within	Referrals	Unsolicited walk-ins	One-stop centers	School placement	Recruiters	Internet
Licensed practical nurse	98	77	88	81	34	57	31	48

Source: ERISS Job Vacancy Survey, 2005.

Wages	4	
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There is a clear wage advantage for licensed practical nurses in EGR 5. The region pays the highest wages among all the contiguous regions. The advantage is significant at every point on the wage curve.



Despite the wage advantage over neighboring regions, there still is a wage problem. The shortage of qualified instructors affects licensed practical nurses, for the same reasons described above.

Educational capacity	4	
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Students often are turned away from nursing colleges. There is a high interest in the occupations, but not enough instructors to teach all who are interested. Data from the Indiana Hospital & Health Association suggest there may be two qualified applicants for every opening, and that if all qualified applicants were admitted, the shortage would disappear.

Pipeline	1	
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Licensed practical nurses must go through a specific course of study and obtain a specific license. Most follow that path after high school. Prior experience in other kinds of work does not contribute to the process of obtaining LPN certification.

From the Occupational Outlook Handbook

All states and the District of Columbia require LPNs to pass a licensing examination after completing a state-approved practical nursing program. A high school diploma or its equivalent usually is required for entry, although some programs accept candidates without a diploma or are designed as part of a high school curriculum. In 2002, approximately 1,100 state-approved programs provided training in practical nursing. Almost six out of 10 students were enrolled in technical or vocational schools, while three out of 10 were in community and junior colleges. Others were in high schools, hospitals and colleges and universities. Most practical nursing programs last about a year and include both classroom study and supervised clinical practice (patient care). Classroom study covers basic nursing concepts and patient care-related subjects, including anatomy, physiology, medical-surgical nursing, pediatrics, obstetrics, psychiatric nursing, administration of drugs, nutrition and first aid. Clinical practice usually is in a hospital, but sometimes includes other settings. (Source: Occupational Outlook Handbook)

Brain drain	2	
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Indiana has a serious brain drain overall, but research shows that it is not serious for the health care professions.

Hispanic/Latino workforce	3	
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Only 3 percent of Hispanic/Latino workers practice health care.

Nursing Aide

Key Points:

- Most nursing aides obtain their CNA certificate while employed.
- Many nursing homes provide this training.
- Few young people aspire to a nursing aide position.

Human resources capacity	2	
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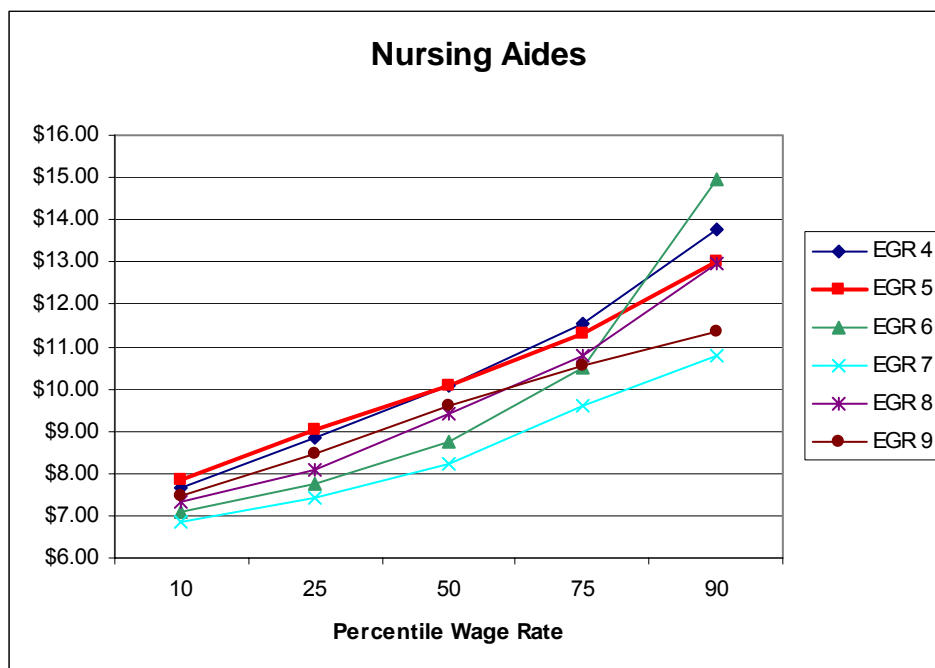
Nursing aides are employed in hospitals and nursing homes. These are large employers with well-developed HR capacity.

Occupation	Newspaper	Hire from within	Referrals	Unsolicited walk-ins	One-stop centers	School placement	Recruiters	Internet
Nursing aide	95	64	93	90	39	49	33	48

Source: ERISS Job Vacancy Survey, 2005.

Wages	3	
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Nursing aides in EGR 5 earn a competitive wage in comparison with aides in the surrounding regions. However, the occupation pays less than many other occupations available to people with postsecondary certifications.



Educational capacity	1	
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The CNA certificate is easily obtained and does not pose the same barrier to entry that exists for other health practice occupations. Many CNAs obtain their certification while working at a hospital or nursing home.

Pipeline	3	
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Few young people are interested in a career in health care support occupations. Many wish to enter into a health care profession, but the nursing aide position is not attractive. Certified nursing assistants typically do not study for certification immediately after high school, but try for other positions and then fall back on nursing aide work if they cannot succeed elsewhere.

From the Occupational Outlook Handbook

In many cases, neither a high school diploma nor previous work experience is necessary for a job as a nursing, psychiatric or home health aide. A few employers, however, require some training or experience. Hospitals may require experience as a nursing aide or home health aide. Nursing care facilities often hire inexperienced workers who must complete a minimum of 75 hours of mandatory training and pass a competency evaluation program within four months of their employment. Aides who complete the program are certified and placed on the state registry of nursing aides. Some states require psychiatric aides to complete a formal training program. The federal government has guidelines for home health aides whose employers receive reimbursement from Medicare. Federal law requires home health aides to pass a competency test covering 12 areas: communication skills; documentation of patient status and care provided; reading and recording vital signs; basic infection control procedures; basic body functions; maintenance of a healthy environment; emergency procedures; physical, emotional and developmental characteristics of patients; personal hygiene and grooming; safe transfer techniques; normal range of motion and positioning; and basic nutrition. (Source: Occupational Outlook Handbook)

Brain drain	1	
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Nursing aide is an entry-level position requiring minimal education. There is no brain drain for this occupation,

Hispanic/Latino workforce	2	
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Hispanic/Latino workers are less than 5 percent of health care support workers in Marion County.

Automotive Service Technician

Key Points:

- Automotive service had adequate educational opportunity.
- Proprietary schools provide the majority of training.
- Mechanics and service technicians need frequent retraining.
- This occupation has the greatest potential loss from brain drain of all the critical occupations.

Human resources capacity	3	
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It is unexpected that schools' placement services rate so low for this occupation. We expected that there would be a strong demand for newly trained technicians, and that the vocational colleges would help their graduates to find work. But the ERISS Job Vacancy Survey shows that only 14 percent of employers rely on the placement services. The preferred means of finding service technicians is newspaper advertisements and referrals from current employees.

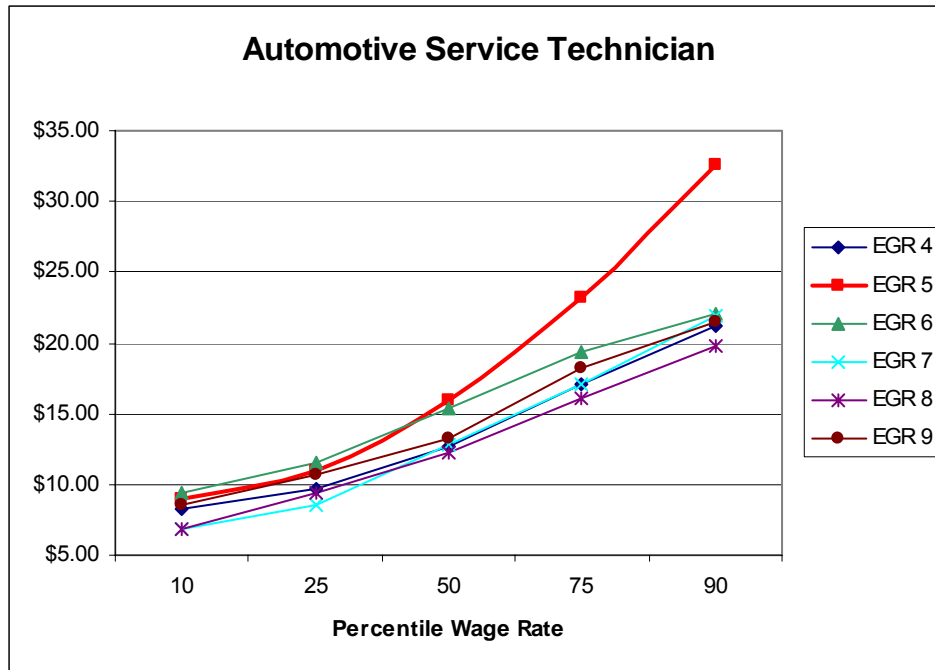
The automotive technician is vital to the development of a motor sports cluster in central Indiana. Most trained technicians will serve as ordinary automotive repairers, but the best should be available to work for racing teams and automotive research companies. One expert involved with the motor sports cluster say that the Indiana Motorsports Association someday will recruit the best students coming out of each class of technical and science courses. But that capability has not yet been developed.

Occupation	Newspaper	Hire from within	Referrals	Unsolicited walk-ins	One-stop centers	School placement	Recruiters	Internet
Automotive service technician	86	57	86	71	14	14	14	14

Source: ERISS Job Vacancy Survey, 2005.

Wages	2	
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The following chart indicates that EGR 5 already pays premium wages at the high end of the wage scale for automotive service technicians.



Educational capacity	2	
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The necessary training for automotive service technicians is provided by both state and proprietary institutions. This combination ensures that the educational capacity is flexible and adequate.

Pipeline	3	
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Automotive service technician has a substantial career ladder. Certification can be obtained only from a technical school or college, but many kinds of experience can contribute to learning and competence. Informal “helping out” around the shop, internships and apprenticeships all are possible in the automotive field. People who are committed to working in racing may volunteer for racing teams or with the venues.

The automotive technician is chiefly a certified position, but scientific and engineering degrees may be added to augment the skill.

From the Occupational Outlook Handbook

Automotive technology is rapidly increasing in sophistication, and most training authorities strongly recommend that people seeking automotive service technician and mechanic jobs complete a formal training program in high school or in a postsecondary vocational school. However, some service technicians still learn the trade solely by assisting and learning from experienced workers. Many high schools, community colleges and public and private vocational and technical schools offer automotive service technician training programs. The traditional postsecondary programs usually provide a thorough career preparation that expands upon the student’s high school repair experience. Postsecondary

automotive technician training programs vary greatly in format, but normally provide intensive career preparation through a combination of classroom instruction and hands-on practice. Some trade and technical school programs provide concentrated training for six months to a year, depending on how many hours the student attends each week. Community college programs normally spread the training over two years; supplement the automotive training with instruction in English, basic mathematics, computers and other subjects; and award an associate's degree or certificate. Some students earn repair certificates and opt to leave the program to begin their career before graduation. Recently, some programs have added to their curriculums training on employability skills such as customer service and stress management. Employers find that these skills help technicians handle the additional responsibilities of dealing with the customers and parts vendors. (Source: Occupational Outlook Handbook)

Brain drain	3	
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Technical positions have a substantial rate of out-migration after graduation from Indiana colleges and postsecondary institutions. This does not apply to certified mechanics, but to all engineering and scientific degrees.

Hispanic/Latino workforce	2	
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Hispanic/Latino workers are about 5 percent of all workers in installation, maintenance and repair occupations. A small number are automotive technicians.

Machinist

Key Points:

- Machinist is a skilled position requiring years of training and practice.
- Labor union training programs traditionally have provided most machinist training.
- Few young people today consider manufacturing to be an appealing career option.
- Wages for skilled machinists in EGR 5 are competitive.

Human resources capacity	3	
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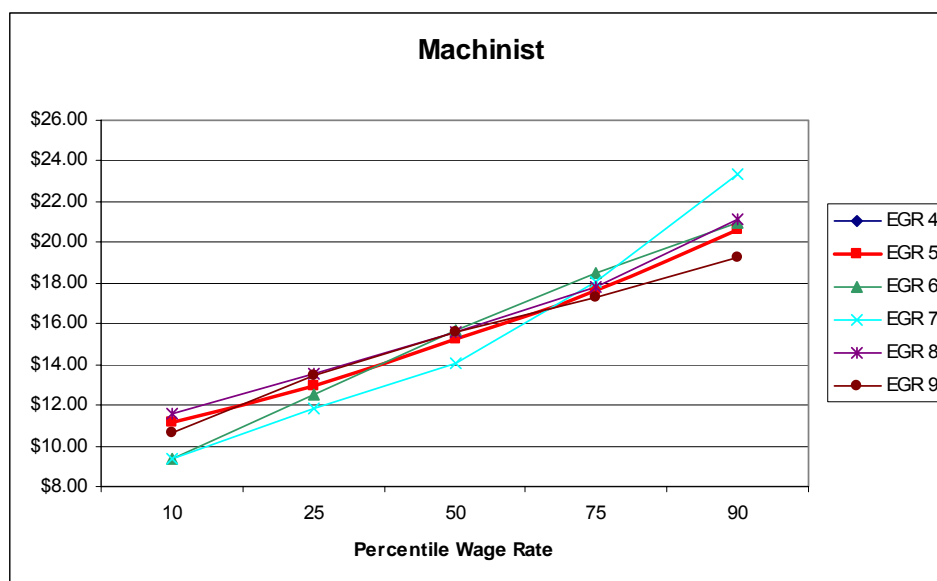
The data from the survey indicate that hiring for machinists is relatively low compared to other occupations. This probably is because many employers were under a hiring freeze during the time of the survey. Still, the rates suggest that companies are not satisfied with the quality of applicants from newspapers and unsolicited walk-in applicants.

Occupation	Newspaper	Hire from within	Referrals	Unsolicited walk-ins	One-stop centers	School placement	Recruiters	Internet
Machinist	65	65	82	52	30	17	3	9

Source: ERISS Job Vacancy Survey, 2005.

Wages	3	
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The six regions are very close together in the distributions of wages for machinists. EGR 5 does not appear to have an advantage over the other regions for this occupation.



Educational capacity	2	
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Training for advanced manufacturing skills is available through both public and proprietary institutions. The latter are extremely flexible and are capable of adapting their course offerings rapidly as new technologies emerge.

The manufacturers of production equipment also provide training specific to their machinery. These equipment companies usually train the workers of every company that buys from them, to ensure that the equipment is used optimally and that their customers are satisfied.

EGR 5 has capacity to educate and train enough workers for production occupations. The problem is that the best minds are required in today's advanced production occupations, and few of the best students today choose to study for technical or production jobs.

Pipeline	5	
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As with all the other manufacturing-related occupations, there is a dearth of young people entering the pipeline for training for machinists.

From the Occupational Outlook Handbook

Machinists train in apprenticeship programs, informally on the job and in high schools, vocational schools or community or technical colleges. Experience with machine tools is helpful. In fact, many entrants previously have worked as machine setters, operators or tenders. People interested in becoming machinists should be mechanically inclined, have good problem-solving abilities, be able to work independently and be able to do highly accurate work (tolerances may reach 1/10,000th of an inch) that requires concentration and physical effort.

High school or vocational school courses in mathematics (especially trigonometry), blueprint reading, metalworking and drafting are highly recommended. Apprenticeship programs consist of shop training and related classroom instruction lasting up to four years. In shop training, apprentices work almost full time and are supervised by an experienced machinist while learning to operate various machine tools. Classroom instruction includes math, physics, materials science, blueprint reading, mechanical drawing and quality and safety practices. In addition, as machine shops have increased their use of computer-controlled equipment, training in the operation and programming of CNC machine tools has become essential. Apprenticeship classes are taught in cooperation with local community or vocational colleges. A growing number of machinists learn the trade through two-year associate's degree programs at community or technical colleges. Graduates of these programs still need significant on-the-job experience before they are fully qualified. (Source: Occupational Outlook Handbook)

Brain drain	1	
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The brain drain applies to individuals who leave the state after obtaining a bachelor's degree and thus is not a factor for this occupation.

Hispanic/Latino workforce	3	
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Hispanic/Latino workers are performing well in many production jobs. No data exist to specify how many are skilled machinists.

Production Machine Operator

Key Points:

- The skill requirement for machine operator is rising.
- Machine operators run a very disparate array of equipment.
- Few young people desire a career in manufacturing.
- Most training is provided on the job.

Human resources capacity	3	
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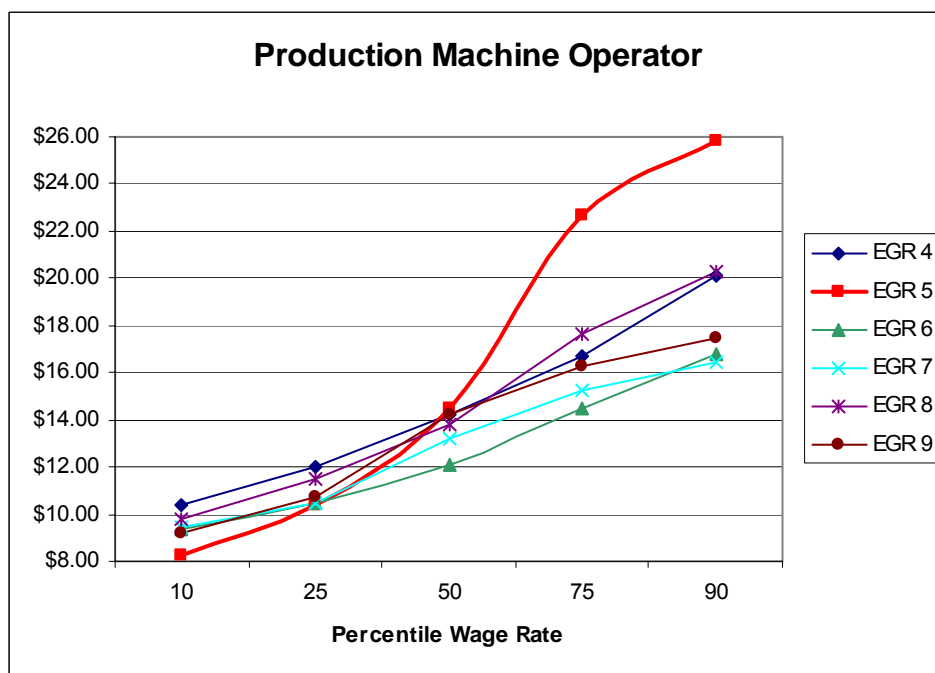
The data from the survey indicate that hiring for machinists is relatively low compared to other occupations. This probably is because many employers were under a hiring freeze during the time of the survey. Still, the rates suggest that companies are not satisfied with the quality of applicants from newspapers and unsolicited walk-in applicants.

Occupation	Newspaper	Hire from within	Referrals	Unsolicited walk-ins	One-stop centers	School placement	Recruiters	Internet
Machine operator	65	65	82	52	30	17	3	9

Source: ERISS Job Vacancy Survey, 2005.

Wages	4	
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Machine operators earn a substantial premium in EGR 5 compared with neighboring regions. We observe, however, that the advantage appears only at the higher levels. At the lower points on the distribution, EGR 5 actually pays the least of any region in the comparison.



Educational capacity	2	
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Training for advanced manufacturing skills is available through both public and proprietary institutions. The latter are extremely flexible and are capable of adapting their course offerings rapidly as new technologies emerge.

The manufacturers of production equipment also provide training specific to their machinery. These equipment companies usually train the workers of every company that buys from them, to ensure that the equipment is used optimally and that their customers are satisfied.

EGR 5 has capacity to educate and train enough workers for production occupations. The problem is that the best minds are required in today's advanced production occupations, and few of the best students today choose to study for technical or production jobs.

Pipeline	5	
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Manufacturing is unpopular as a career choice among central Indiana high school students.

From the Occupational Outlook Handbook

Machine setters, operators, and tenders-metal and plastic learn their skills on the job. Trainees begin by observing and assisting experienced workers, sometimes in formal training programs. Under supervision, they may start as tenders, supplying materials, starting and stopping the machine or removing finished products from it. Then they advance to the more difficult tasks performed by operators, such as adjusting feed speeds, changing cutting tools or inspecting a finished product for defects. Eventually, they become responsible for their own machines.

The complexity of the equipment largely determines the time required to become an operator. Most operators learn the basic machine operations and functions in a few weeks, but they may need a year to become skilled operators or to advance to the more highly skilled job of setter. Although many operators learn on the job, some community colleges and other educational institutions offer courses and certifications in operating metal and plastics machines. In addition to providing on-the-job training, some employers send promising machine tenders to operator classes. Other employers prefer to hire workers who have completed or are enrolled in a training program. (Source: Occupational Outlook Handbook)

Brain drain	1	
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Machine operator is not a college-trained occupation, so the brain drain is not a factor for this occupation..

Hispanic/Latino workforce	3	
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Nearly 12 percent of Hispanic/Latino workers are in productions jobs (Marion County only). No data exist to specify how many are skilled machine operators. Still, this occupation draws one of the highest rates of Hispanic/Latino participation of the occupations studied.

Welder

Key Points:

- Welding requires both training and experience.
- The rate of turnover among welders is high for manufacturing, less high for construction.
- Few young people consider a career in welding to be appealing.
- Few specialty courses in welding are available.

Human resources capacity	3	
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Many firms that employ welders are small. These employers typically will not have a full-time human resources director and a firm policy. Such firms tend to hire walk-in applicant with little screening.

Occupation	Newspaper	Hire from within	Referrals	Unsolicited walk-ins	One-stop centers	School placement	Recruiters	Internet
Welder	79	78	84	80	68	48	1	45

Source: ERISS Job Vacancy Survey, 2005.

Wages	2	
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EGR 5 does not pay the highest wages for welders. EGR 5's wages for welders ranks second or third at every point in the wage curve for welders. Both EGR 6 and EGR 7 provide higher wages for welders for at least part of the distribution. Of course, the inverse of this fact is that EGR 5 has a consistent wage advantage over EGRs 4, 8 and 9.



Educational capacity	2	
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Training for advanced manufacturing skills is available through both public and proprietary institutions. The latter are extremely flexible and are capable of adapting their course offerings rapidly as new technologies emerge.

The manufacturers of production equipment also provide training specific to their machinery. These equipment companies usually train the workers of every company that buys from them, to ensure that the equipment is used optimally and that their customers are satisfied.

EGR 5 has capacity to educate and train enough workers for production occupations. The problem is that the best minds are required in today's advanced production occupations, and few of the best students today choose to study for technical or production jobs.

Pipeline	5	
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As noted in all the manufacturing/production occupations, the pipeline for welders suffers from a poor reputation, leading to low interest by the best students.

Society's negative attitude toward blue-collar work is largely to blame for the shortage, said Ed Norman, a welding instructor from Missouri and a member of the American Welding Society. School guidance counselors and parents have not encouraged students to pursue careers such as welding, Norman said, because they mistakenly believe it's a dead-end job.

“But these aren't jobs that pay only \$10 an hour,” Norman said. “I have young people coming right out of my program earning several thousand dollars a week” on construction projects such as power plants and pipelines.¹⁸

From the Occupational Outlook Handbook

Training for welding, soldering and brazing workers ranges from a few weeks of school or on-the-job training for low-skilled positions to several years of combined school and on-the-job training for highly skilled jobs. Formal training is available in high schools, vocational schools and postsecondary institutions, such as vocational-technical institutes, community colleges and private welding schools. The armed forces operate welding schools as well. Some employers provide training. Courses in blueprint reading, shop mathematics, mechanical drawing, physics, chemistry and metallurgy are helpful. Knowledge of computers is gaining importance, especially for welding, soldering and brazing machine operators, who are becoming responsible for the programming of computer-controlled machines, including robots.

Some welders become certified, a process whereby the employer sends a worker to an institution, such as an independent testing lab or technical school, to weld a test specimen according to specific codes and standards required by the employer. Testing procedures are based on the standards and codes set by one of several industry associations with which the employer may be affiliated. If the welding inspector at the examining institution determines that the worker has performed according to the employer's guidelines, the inspector then will certify the welder being tested as able to work with a particular welding procedure. (Source: Occupational Outlook Handbook)

Brain drain	1	
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The brain drain does not affect welders.

Hispanic/Latino workforce	3	
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Nearly 12 percent of Hispanic/Latino workers are in productions jobs (Marion County only). No data exist to specify how many are welders. Still, this occupation draws one of the highest rates of Hispanic/Latino participation of the occupations studied.

¹⁸ *Welders worry trade's spark is dying out*, Rick Barrett, Milwaukee Journal Sentinel, Nov. 15, 2005.

Precision Inspector

Key Points:

- Nearly all inspectors are promoted from within.
- There is no training for inspectors, except on-the-job training.
- EGR 5 has a wage premium for inspectors.

Human resources capacity	3	
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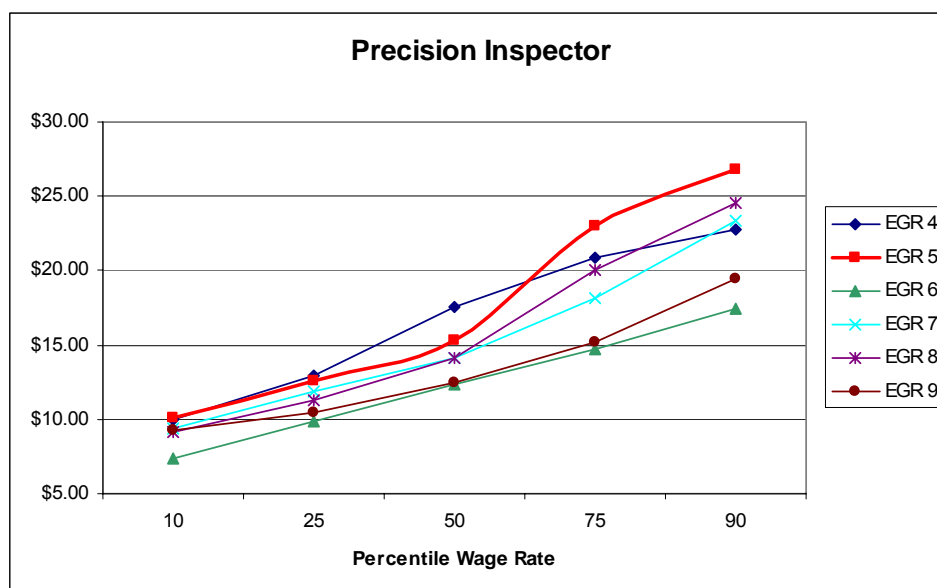
The reliance on hires from within shows that the hiring practices for supervisors is not highly sophisticated. It might be argued, however, that promoting from within is the ideal means of choosing inspectors, since people who have experience producing a part will understand how to check it against specifications.

Occupation	Newspaper	Hire from within	Referrals	Unsolicited walk-ins	One-stop centers	School placement	Recruiters	Internet
Inspector, tester	61	75	66	39	38	16	10	23

Source: ERISS Job Vacancy Survey, 2005.

Wages	2	
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EGR 5 pays the best wages for experienced inspectors. The wage curve chart below shows that inspectors in EGR 5 earn more than those in the surrounding regions at every point in the distribution, with a single exception. At the median wage level, EGR 5 falls below EGR 4. Central Indiana recovers the advantage between the median and 75th percentile.



Educational capacity	2	
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Training for advanced manufacturing skills is available through both public and proprietary institutions. The latter are extremely flexible and are capable of adapting their course offerings rapidly as new technologies emerge.

The manufacturers of production equipment also provide training specific to their machinery. These equipment companies usually train the workers of every company that buys from them, to ensure that the equipment is used optimally and that their customers are satisfied.

EGR 5 has capacity to educate and train enough workers for production occupations. The problem is that the best minds are required in today's advanced production occupations, and few of the best students today choose to study for technical or production jobs.

Pipeline	4	
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The job of inspector and tester has a significant pipeline. Inspectors take the job after spending time at one or more production jobs. As inspectors, they must monitor the quality of work with which they are familiar from experience. An inspector who has wider experience within a plant will be more valuable.

From the Occupational Outlook Handbook

Training requirements vary, based on the responsibilities of the inspector, tester, sorter, sampler or weigher. For workers who perform simple "pass/fail" tests of products, a high school diploma generally is sufficient. Simple jobs may be filled by beginners provided with in-house training. Training for new inspectors may cover the use of special meters, gauges, computers or other instruments; quality-control techniques; blueprint reading; safety; and reporting requirements. There are some postsecondary training programs in testing, but many employers prefer to train inspectors on the job. (Source: Occupational Outlook Handbook)

Brain drain	1	
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Inspectors and testers are not usually college-educated, and thus the brain drain is not an issue.

Hispanic/Latino workforce	3	
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Nearly 12 percent of Hispanic/Latino workers are in production jobs (Marion County only). No data exist to specify how many are inspectors. Still, this occupation draws one of the highest rates of Hispanic/Latino participation of the occupations studied.

Chemical Machine Operator

Key Points:

- The skill requirement for chemical machine operator is rising.
- Machine operators run a very disparate array of equipment.
- Few young people desire a career in manufacturing.
- Most training is provided on the job.

Human resources capacity	2	
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The data from the survey indicate that hiring for chemical production jobs is limited to a few employers. This probably is because many employers were under a hiring freeze during the time of the survey. Still, the rates suggest that companies are not satisfied with the quality of applicants from newspapers and unsolicited walk-in applicants.

Occupation	Newspaper	Hire from within	Referrals	Unsolicited walk-ins	One-stop centers	School placement	Recruiters	Internet
Machine operator	65	65	82	52	30	17	3	9

Source: ERISS Job Vacancy Survey, 2005.

Wages	2	
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It was not possible to generate a comparison of chemical technician positions. The regions surrounding EGR 5 have few chemical producers and the data were suppressed for all the surrounding regions. Chemical technicians and chemical process operators earn a substantial premium in EGR 5 compared with other similar occupations.

Educational capacity	2	
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Training for advanced manufacturing skills is available through both public and proprietary institutions. The latter are extremely flexible and are capable of adapting their course offerings rapidly as new technologies emerge.

The manufacturers of production equipment also provide training specific to their machinery. These equipment companies usually train the workers of every company that buys from them, to ensure that the equipment is used optimally and that their customers are satisfied.

EGR 5 has capacity to educate and train enough workers for production occupations. The problem is that the best minds are required in today's advanced production occupations, and few of the best students today choose to study for technical or production jobs.

Pipeline	5	
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Manufacturing is very unpopular as a career choice among central Indiana high school students.

From the Occupational Outlook Handbook

Machine setters, operators, and tenders-metal and plastic learn their skills on the job. Trainees begin by observing and assisting experienced workers, sometimes in formal training programs. Under supervision, they may start as tenders, supplying materials, starting and stopping the machine or removing finished products from it. Then they advance to the more difficult tasks performed by operators, such as adjusting feed speeds, changing cutting tools or inspecting a finished product for defects. Eventually, they become responsible for their own machines.

The complexity of the equipment largely determines the time required to become an operator. Most operators learn the basic machine operations and functions in a few weeks, but they may need a year to become skilled operators or to advance to the more highly skilled job of setter. Although many operators learn on the job, some community colleges and other educational institutions offer courses and certifications in operating metal and plastics machines. In addition to providing on-the-job training, some employers send promising machine tenders to operator classes. Other employers prefer to hire workers who have completed or are enrolled in a training program. (Source: Occupational Outlook Handbook)

Brain drain	1	
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Chemical machine operator is not a college-trained occupation, and thus brain drain is not an issue.

Hispanic/Latino workforce	3	
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Nearly 12 percent of Hispanic/Latino workers are in productions jobs (Marion County only). No data exist to specify how many are involved in chemical production. Still, this occupation draws one of the highest rates of Hispanic/Latino participation of the occupations studied.

Supervisor of Transportation Workers

Key Points:

- Supervisors usually are promoted from within.
- Many supervisors need leadership training.
- The shortage is due to lack of skill, not the number of potential applicants.

Human resources capacity	3	
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The reliance on referrals from current employees and on walk-in applicants shows that the hiring practices for supervisors are not highly sophisticated.

Occupation	Newspaper	Hire from within	Referrals	Unsolicited walk-ins	One-stop centers	School placement	Recruiters	Internet
Supervisor of transportation workers	65	76	78	32	22	11	22	41

Source: ERISS Job Vacancy Survey, 2005.

Wages	2	
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The following chart shows that supervisors of transportation workers tend to earn very good wages. EGR 5's wage curve is only moderate in comparison to the contiguous regions. It lies in second or third place among the regions. However, the wages offered for supervisors are substantially greater than those paid to the occupations that feed into the supervisor position. There is sufficient monetary inducement for qualified workers to move into the supervisor position.



Educational capacity	3	
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Most supervisors are promoted from within. They typically are people with a good performance record as a laborer, forklift operator or other position. However, competent line workers often lack the special qualities of a leader or supervisor. People promoted from the floor to the position of supervisor very often need a short course in leadership or management.

Pipeline	4	
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The pipeline for supervisors passes through the occupations that are supervised. The positions are filled by selecting from among the line workers. For this reason, there are always candidates for the position of supervisor.

From the Occupational Outlook Handbook

Many jobs in the truck transportation and warehousing industry require only a high school education, although an increasing number of workers have at least some college education. Increased emphasis on formal education stems from increased complexity in the industry. Nearly all operations involve computers and information management systems. Many occupations require detail-oriented people with computer skills. A growing number of employers recommend some form of formal training either in-house or through trade or union programs. Although the federal government does not mandate these programs, the trend is toward certification and standardized competency. (Source: Occupational Outlook Handbook)

Brain drain	1	
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There is no evidence that logistics workers are likely to leave Indiana at a significant rate. They typically are entry-level workers with only high school educations or less.

Hispanic/Latino workforce	3	
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Few Hispanics/Latinos have risen to supervisory positions in the logistics sector. As the overall workforce incorporates more Hispanic/Latino workers, it would be advisable to discover latent talent for leadership among the line workers.

Truck Driver

Key Points

- There is a nationwide shortage of about 20,000 truckers or 1.5 percent of the trucker workforce.
- Recruitment of young people for a career in trucking is ineffective due to the legal requirements that cause delayed entry into the career.
- Trucking competes with construction for workers with an aptitude for strenuous work, and recent growth in construction has contributed to the trucker shortage.
- Wages for truckers have lagged behind construction since 2000 and are returning slowly to parity with construction wages.
- Wages for truckers must compensate for the undesirable qualities of the job, chief among which is the necessity of being away from home for extended periods.
- Part of the solution to the trucking shortage may be to recruit more women and minority drivers.

Human resources capacity	2	
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Occupation	Newspaper	Hire from within	Referrals	Unsolicited walk-ins	One-sceneters	School placement	Recruiters	Internet
Truck driver	91	50	96	91	30	1	42	36

Source: ERISS Job Vacancy Survey, 2005.

Wages	4	
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Wages for truck drivers generally are higher in EGR 5 than in the surrounding regions (See chart “Truck Driver,” below). This trend is not universal, however. Both EGR 6 (at the 10th percentile) and EGR 9 (at the 90th percentile) appear to pay a higher wage at one point on the wage curve.

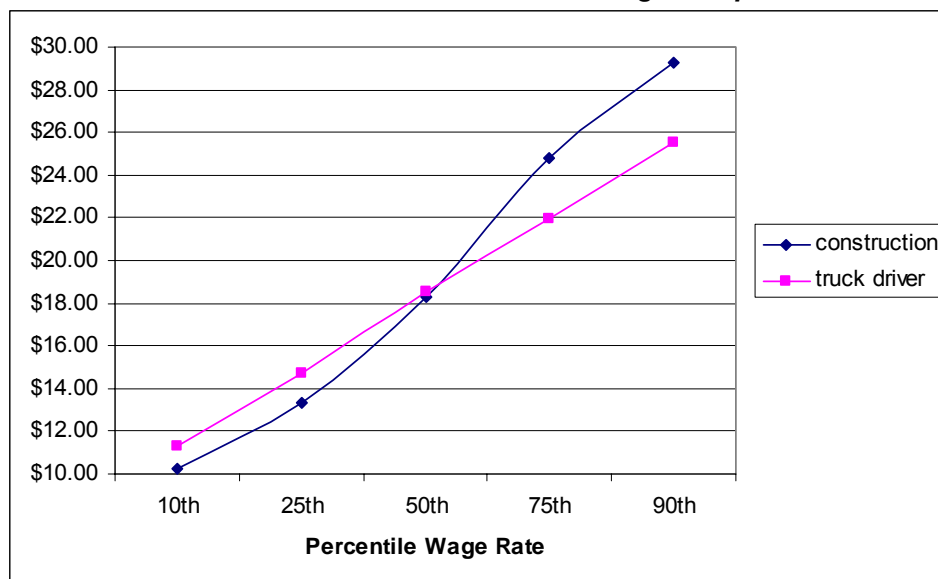
Truck drivers’ earnings are commensurate with other occupations that require physical exertion. They are somewhat lower than the rates in the construction industry. This is believed to be a factor in the trucking shortage. That argument is made by the American Trucking Association:

Indeed, a change in the competitive position of wages in the freight trucking industry may be responsible for some of the increased difficulty that trucking companies have experienced in attracting and retaining qualified drivers in the past year. An industry that is often identified as a competitor for labor is the construction industry, which is relatively comparable to trucking in terms of pay and educational requirements. Manufacturing may also be cited as an alternative occupation.¹⁹

Chart 23 verifies that this national trend holds true in our region. The chart shows that the wage scale for truckers lies below that for all construction workers from the median wage upward. In other words, construction outbids trucking for the more experienced or more talented half of workers.

¹⁹ The U.S. Truck Driver Shortage: Analysis and Forecasts, Global Insight Inc., May 2005, p. 30.

Chart 23
Truck Driver v. Construction Worker Wage Comparison



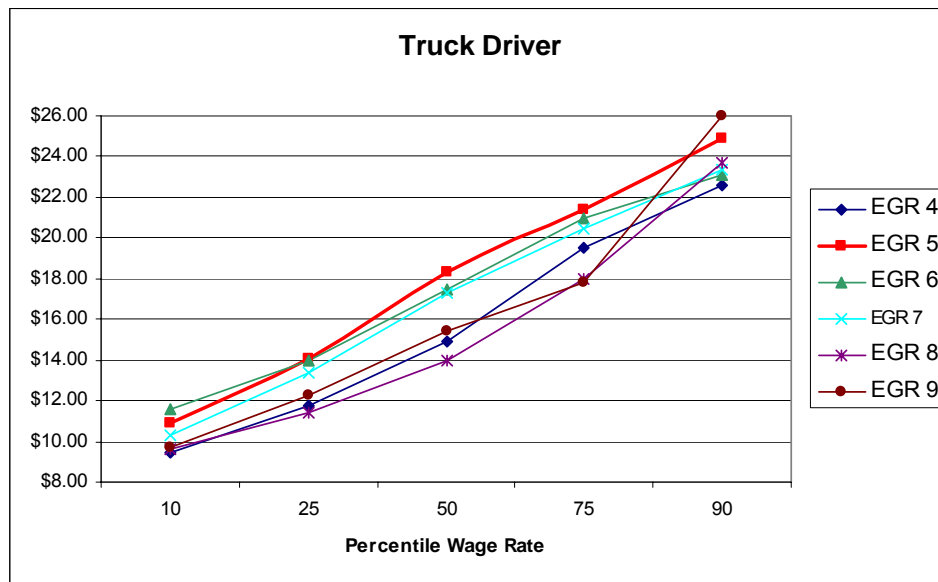
Source: egr5_wages.xls

The national association adds:

If the trucking industry is to attract the higher share of workers that it needs to achieve the growth projected over the next 10 years, it will be necessary for earnings in the industry to, at a minimum, return to the relative wage position that prevailed during the 1990s. At present weekly earnings in long-distance trucking are 1.5 percent below the average in construction. . . Average earnings in long-distance trucking will have to increase by at least eight percentage points more than the earnings growth in construction in the near future in order for the industry to regain the relative wage position it maintained during the 1990s.²⁰

We believe the same situation exists within EGR 5. Although the average wages for construction workers and for truck drivers are similar, the complete wage curve shows wages for truckers falling short. In addition, the Indiana Department of Workforce Development's INEWS data source shows that the average wage for the truck transportation industry (including truckers and others workers in the industry) is \$774 a week, compared to \$930 a week for the construction trades.

²⁰ The U.S. Truck Driver Shortage: Analysis and Forecasts, Global Insight Inc., May 2005, p. 31.



CDLs Issued

2003 -- 12,329
 2004 -- 14,306
 2005 -- 14,744

Educational capacity	2	
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The number of training facilities probably is adequate for building up the trucking fleet in EGR 5. Data provided by the Indiana Bureau of Motor Vehicles show that commercial driver's licenses in EGR 5 have increased in number each of the two previous years. The yearly totals of CDLs issued in the region are shown in the box at right. This shows that the number of licenses is increasing in response to the demand for more drivers. The actual increase of total drivers is not clear from this information, however. The numbers shown here include both new licenses and renewals. It is unclear, therefore, how many net new drivers are added each year due to local licensure. The fastest growth is occurring in Shelby and Hamilton counties, which have increased their annual licenses by 54 percent and 45 percent, respectively. Increases of 36 percent to 38 percent have occurred in Boone, Hancock, Hendricks and Madison counties. Johnson and Morgan counties have added 23 percent and 26 percent, respectively, to their rate of annual licensures. Marion County has remained flat during the past three years. Marion County residents obtain nearly half of the nine-county total, but that share has not increased since 2003.

Training is prohibitively expensive for many potential drivers. The program, which runs six to 10 weeks, usually costs several thousand dollars. However, the cost of training often is deferred or paid outright by trucking companies in search of drivers. Only individuals who plan to be an independent, owner-operator face a serious financial challenge.

Pipeline	4	
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The shortage of truckers²¹ in EGR 5 is consistent with that of the rest of Indiana and the United States. No special factors make the problem more severe in our region than elsewhere. Nevertheless, the problem is severe and projected to become worse.

Probably no other occupation has been the subject of as many songs as truck driver. One might go so far as to say that the trucker has replaced the cowboy as America's solitary hero. But the qualities that make for a good song also tend to make long-haul trucking a difficult job. Long hours, the dangers of the road in all conditions, sleepless nights and often the need to load and unload the truck are a few of the unappealing features of the occupation. More than anything else, the necessity of being away from home for days at a time makes trucking a difficult job.

Trucking probably is one of the most segregated occupations in the United States. More than two-thirds of truck drivers are white males, who are only about one-third of the labor force. A part of the strategy for meeting the need for truckers in the coming years is to increase participation in the occupation among three groups:

- Women
- Blacks
- Hispanics/Latinos

Women truck drivers are about 4 percent of all long-haul, interstate drivers. The share has not increased during the last 10 years. Black and Hispanic/Latino drivers, however, are on the increase. Hispanic/Latino drivers have increased from 9 percent to 11 percent, while black drivers have grown from 11 percent to more than 15 percent of all drivers nationwide. These trends are viewed nationally and within EGR 5 as at least one part of the solution.

The upward trend in the share of truck drivers of Hispanic origin is a positive development for the potential future supply of truck drivers, since this is a demographic group that is projected to show strong growth.²²

Safety and security regulations have increased in recent years, and these heightened regulations make it harder for some people to obtain the commercial driver's license. Among the regulations are hazardous materials endorsements; English-language requirement; prohibition against drivers with high blood pressure; mandatory minimum training; limited hours of service; screening of driver's history; H2-B provisions for immigrant workers; and NAFTA trucking provisions.

Suffice it to say that these regulations, while contributing to the safety and efficiency of the trucking industry, have narrowed the field of individuals eligible to obtain a commercial driver's license and accept work as a long-haul trucker.

"Truckers have to work on the road, eat on the road, sleep on the road. When they get to the end of the road, they often have to unload their truck, load it up again and then get right back on the road. It is not an easy life."

Kenneth Cragen
Indiana Motor Truck Assoc.

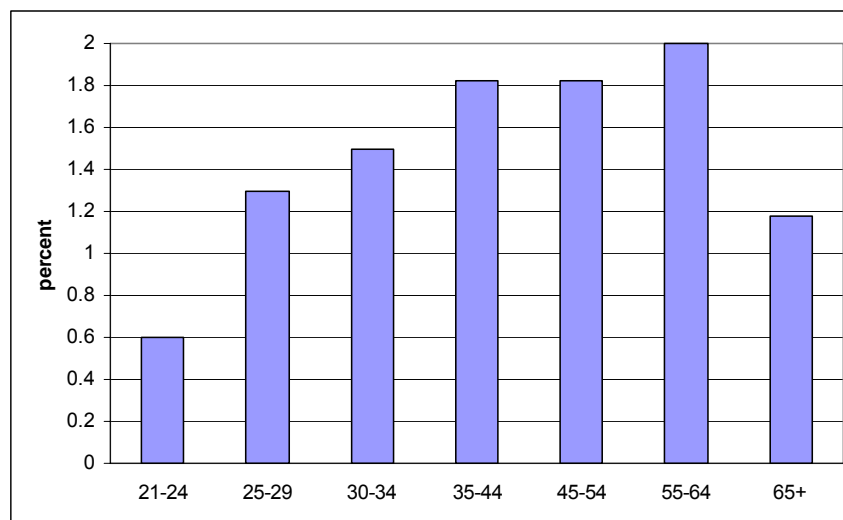
²¹ As discussed in this report, a "trucker" is a long-haul driver of a tractor-trailer or heavy truck. Light trucks for local delivery are not included in this analysis.

²² The U.S. Truck Driver Shortage: Analysis and Forecasts, Global Insight Inc., May 2005, p. 18.

The career ladder for truck drivers is not a broad or smooth one. Indeed, this is a particular problem for the occupation.

One of the unusual features of the trucking career is the delayed entry into the occupation. Chart 24 shows that the share of truckers as a portion of all male workers increases with older age brackets.

Chart 24
Male Truck Drivers as a Share of the Labor Force, by Age



Source: American Associations, 2005

Kenneth Cragen of the Indiana Motor Truck Association explains that the particular barrier in the career ladder for interstate truckers is caused by a legal requirement. A driver must be at least 23 years old before beginning a career of interstate hauling. The commercial driver's license may be obtained at age 21, and then two years of experience are required before the driver is qualified for long-haul interstate work. Consequently, an 18-year-old who is interested in becoming a trucker must wait three years before beginning to realize that ambition and five years before actually beginning.

Many other occupations require prospective workers to defer their ambitions for two, four or more years. But those years are usually spent in active preparation at a university or in an apprenticeship. By contrast, there is little the 18-year-old can do to prepare. Cragen says that most young people settle into an alternative career during that five-year wait, and many who planned to become truck drivers at the start of their career are persuaded to take other work before they become eligible.

Since the pipeline for young people to move into a trucking career is hampered by this regulation, most trucking companies attempt to fill vacancies by recruiting from competitors. Often the strategy involves assuring truckers that they will have weekends at home on a regular basis, that they will never have to load or unload their trailer or that other, similar amenities or advantages are in the offing.

From the Occupational Outlook Handbook

State and federal regulations govern the qualifications and standards for truck drivers. All drivers must comply with federal regulations and any state regulations that are stricter than federal requirements. Truck drivers must have a driver's license issued by the state in which they live, and most employers require a clean driving record. Drivers of trucks designed to carry 26,000 pounds or more – including

most tractor-trailers, as well as bigger straight trucks – must obtain a commercial driver’s license from the state in which they live. All truck drivers who operate trucks transporting hazardous materials must obtain a CDL, regardless of truck size. Federal regulations governing the CDL exempt certain groups, including farmers, emergency medical technicians, firefighters, some military drivers and snow and ice removers. In many states, a regular driver’s license is sufficient for driving light trucks and vans.

To qualify for a commercial driver’s license, applicants must pass a written test on rules and regulations and then demonstrate that they can operate a commercial truck safely. A national database permanently records all driving violations incurred by people who hold commercial licenses. A state will check these records and deny a commercial driver’s license to a driver who already has a license suspended or revoked in another state. Licensed drivers must accompany trainees until the trainees get their own CDL. Information on how to apply for a commercial driver’s license may be obtained from state motor vehicle administrations. (Source: Occupational Outlook Handbook)

Brain drain	1	
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Truck driver does not require a bachelor’s degree, so brain drain is not an issue.

Hispanic/Latino workforce	3	
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Hispanics/Latinos are about 3 percent of long-haul truckers across the country. Enlarging the demographic make-up of trucking to include more minorities and women is one of the recommended strategies. However, it is not a primary strategy in the short term, because the barriers to entry for Hispanics/Latinos are significant.

Warehouse Laborer

Key Points:

- The shortage of laborers is caused by high turnover among the available labor force.
- Employers blame a poor work ethic.
- Hispanics/Latinos are favored by many logistics employers.

Human resources capacity	3	
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Demand for laborers occurs in a variety of companies. Some are very large and have national recruiting capacity. Others are much more limited in their capacity.

The following table shows that referrals are the preferred means of recruiting workers for warehouse and courier service labor. These usually come from existing employees, and sometimes provide that employee with a bonus if the newly referred workers in hired and stays on the job for 90 days or more.

Occupation	Newspaper	Hire from within	Referrals	Unsolicited walk-ins	One-stop centers	School placement	Recruiters	Internet
Laborers	72	46	89	70	22	7	6	13

Source: ERISS Job Vacancy Survey, 2005.

Wages	2	
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The data show that EGR 5 pays competitive wages for laborers.

Logistics employers in EGR 5 pay premium wages for warehouse and courier service laborers. As the chart below shows, the curve for wages is steeper in EGR 5 than in the contiguous regions. Our region pays better for both starting laborers and for the most experienced workers.



Educational capacity	2	
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Laborers in general have no requirement for education or professional certification. However, some employers (e.g., Federal Express) require employees to have a high school diploma or general equivalency degree. Assisting potential employees to obtain these certificates would help reduce the shortage of laborers by expanding the pool of potential workers.

Pipeline	5	
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Laborer is an entry-level position. There is no pipeline leading into it, except the willingness to do the work with a good ethic. For immigrant workers, training in English language can be beneficial.

Logistics firms that handle hazardous materials or operate in or around airports also require workers to pass security checks. Federal Express employees must pass the same security checks as an employee of the Federal Aviation Administration. These include a clean background check and proof of five years of U.S. residency.

Another major factor limiting the supply of laborers is transportation. Many urban residents are willing and qualified to work in distributions centers, but cannot get to the job. In EGR 5, most of these potential workers live in Marion County. Most of the new logistics jobs are in the surrounding counties, especially Hendricks, Hancock and Shelby. Public or mass transit does not run to these areas or, in the case of distribution hubs at the Indianapolis International Airport, do not run during the overnight hours when distribution centers are busiest.

From the Occupational Outlook Handbook

Most material-moving jobs require little work experience or specific training. Some employers prefer applicants with a high school diploma, but most simply require workers to be at least 18 years old and physically able to perform the work. For those jobs requiring physical exertion, employers may require that applicants pass a physical exam. Some employers also require drug testing or background checks before employment. These workers often are younger than workers in other occupations, reflecting the limited training but significant physical requirements of many of these jobs. (Source: Occupational Outlook Handbook)

Brain drain	1	
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The brain drain refers to the departure of college-educated individuals. Laborers typically are not college-educated.

Hispanic/Latino workforce	3	
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Hispanics/Latinos are favored by employers for warehouse occupations. Male and female workers are both in demand for warehousing and courier positions. Many positions are physically demanding and require especially fit individuals.

III. Methodology

The Root Causes Report is based on interviews and discussion with experts, as well as the analysis of secondary data and original data collected by the participants. The earlier Occupations and Skill Shortages Report was an exercise in data analysis, but this new phase of the Strategic Skills Initiative called for a different approach. This section explains in detail how the work was accomplished and how the various assessments were estimated, validated and refined.

The baseline criteria were set in the SSI Handbook, version 2.0. The EGR 5 report adheres to the instructions in the handbook. We have diverted from the recommended methodology only by introducing additional detail to each dimension, as discussed below. We have considered each of recommended possible root causes, including:

- Human resources capacity
- Educational capacity
- Wages
- The pipeline
- Brain drain

Each of these is a potential source of help or hindrance to the supply of workers to a given occupation. Wages, for example, help fill vacancies in an occupation quickly if the wage rates for an occupation are higher than what a worker with similar skills can earn at another job. Wages also can be an incentive if our region pays more than contiguous regions and provides an incentive to those workers to commute into EGR 5. Education capacity is a critical factor for some occupations – those requiring a lengthy period of study or preparation. We found each of the factors to be important for some occupations, but none for all.

Our report discusses each of these issues in general terms first, and then again as the issue affects each of the 13 particular occupations that were identified in the first phase to be critical to EGR 5 and in chronic short supply. Some issues are discussed in greater detail, and some only summarily. A briefer treatment does not imply that the issues was ignored, but only that the investigation turned up a very simple and straightforward finding with respect to that issue. If the treatment of the issue does not seem complete in the occupational section, the reader will please refer to the larger section relating to the issue.

We have added one additional criterion to the general discussion. This is the emergence of the Hispanic/Latino labor force. The Hispanic/Latino community is active in the labor market and is respected by employers in the community. The rate of participation among newly arrived Hispanics/Latinos is greater than that for the native-born U.S. population, because Hispanics/Latinos come to America to work, and only those who want to work come.

The general methodology of the report involved iterations of research, discussion, revision, further research. In more detail, the process followed the steps shown below:

1. Gathered all pertinent, current data
2. Gathered all useful reports and analysis relevant to the subject
3. Read and assessed the available information and produced “strawman” conclusions
4. Presented the “strawman” findings to experts
5. Revised the findings and conclusions recommended by experts
6. Assigned relative weights and values to each factor
7. Presented entire report to the consortium for approval
8. Revised the report as recommended by the consortium.

We relied on the principle of the “strawman” during this process. A strawman is a target, set up to be knocked down. In our application, the strawman was the set of preliminary assumptions that we presented to our consortium.

When experts and industry representatives were consulted, we came to them prepared with data, assumptions and conclusions. The experts always were asked to supplement our data, and to correct, refine or, if necessary, contradict our assumptions. Later, we returned to those same experts with revised data, assumptions and conclusions. Each iteration brought the process closer to consensus, as well as to the ultimate root causes of the shortages in our region.

Human Resources

The human resources capacity element of the report was aided by original research by the Greater Indianapolis Chamber of Commerce and Indianapolis Private Industry Council a year ago. The survey shows which aspects of personnel management and recruiting are considered by area employers to be most difficult. The survey was developed and implemented to design a business-services program to assist small companies. Subsequent interviews and documentary research were done to flesh out the relevant findings of the local survey.

Educational Capacity

Educational capacity was important for some, but not all, of our 13 critical occupations. We first identified which of the occupations have a legal or statutory requirement for education, which have a substantial training requirement for skill and which occupations have a minimal training requirement. We then obtained detailed data for these occupations. The data were obtained from the Indiana Commission for Higher Education, the Indiana Commission on Proprietary Education, Ivy Tech Community College of Indiana and the Indiana Bureau of Motor Vehicles. We obtained current data for education and training, but the data were not illustrative until we discussed the numbers with our experts.

Wages

Wages were the only area subject to a detailed analysis of data. We relied on the wage files in the SSI data packet. Two significant alterations to the data were made. The first was the simple addition of wage scale data for teachers. All data for teachers were omitted from the provided data, and it was necessary to include teachers in the analysis discussed below. Second, the wage data were converted from decile/quintile categories into dollar brackets. The dollar-bracket information allowed a more meaningful assessment of the occupation. Wages must be assessed in two ways. The first is among areas: does the occupation pay more or less in one region than in another, and is the difference enough to encourage or discourage workers to migrate or commute to the higher-wage location? The second consideration is within the area: does a particular occupation pay competitive wages compared to other, similar work? This question applies at all levels of the wage scale and educational attainment scale. For instance, would a young woman with a bachelor's degree earn more as a nurse or as a teacher? Would a high school-educated man earn more as a construction worker or a truck driver? These questions were found to be very important in several cases.

One deficiency in the wage data hampered our analysis. The wage scale for registered nurses was accurate, but lacked necessary detail. Registered nurses come in three levels of education – associate's degree, bachelor's degree and master's degree. Experts in the field advised us that the master's level is especially critical to the supply and that the wages provided in nursing education programs are a disincentive to move from practice to teaching. We were not able to confirm this, however, because the data do not distinguish the master's level from the lesser levels, nor the teaching nurses from those in medical practice.

The Pipeline

The pipeline for workers could not be evaluated in every aspect and detail. To understand this feature of the labor supply, it is necessary to look at longitudinal data for a cohort of individuals over a period of years. These kinds of data are very rare, and what do exist are not specific enough to illuminate conditions in our particular region or our specific occupations. We were able, however, to report a very good sense of the beginning of the pipeline. The Learn More Indiana Resource Center Web site provides career plan information from Indiana high schools. These data show which occupations attract the students' interest and which the students disdain.

In the pipeline section, we also consider the career ladders that lead into the occupation. The career ladders considered here are very specific to the occupation and answer the question, "How does a person qualify for this job?" Many career ladders present a number of related occupations in order from entry-level to advanced positions. But these "ladders" do not represent a realistic career path for an individual. Consider the following statement from a career counseling Web site:

Nurses have an opportunity to progress up the career ladder from licensed practical nurse (LPN) to associate degree (AD) and diploma preparation, to baccalaureate (BSN) and advanced practice options at the master's level (MSN), including nurse practitioner programs (NP) or clinical specialist in a content area (such as gerontology). You may wish to become a nurse researcher or teach future nurses in a community college or a university setting."²³

This statement is factual but unrealistic. Very few individuals touch all the bases as described. The majority begins with a program to obtain a bachelor's degree. They do not bother to obtain the LPN or associate's level certification or to practice at those levels.

Realistic career ladders describe the actual paths that an individual may, and that the majority of individuals do, follow to reach an occupation. These genuine career ladders usually are very short. Most often, they involve school, on-the-job training and experience. It is this simpler but more meaningful sense of the term "career ladder" that is presented for each occupation under the heading of "The Pipeline."

Brain Drain

The best work in Indiana on the subject of the brain drain was performed five years ago by the Indiana Fiscal Policy Institute and the Indiana Commission for Higher Education. No more recent source has provided the degree of detail necessary to our purposes. We therefore have relied on the Indiana Human Capital Retention Study.

The detailed portion of this report contains two sections. The first discusses the major issues in general terms. The second reiterates the information as it pertains to each of the occupations. In the occupation-specific portion of the report, information is categorized by the six major factors and separated by a colored bar containing three divisions. In one of these divisions, the criteria are listed. In the second, the significance of that factor to the occupation is rated. In the third, succinct observations are summarized. In most instances, the occupation is discussed in greater detail below the colored bar.

Hispanic/Latino Workforce

This element discusses whether Hispanic/Latino workers are employed in EGR 5 to work at a given occupation. We recognize that the Hispanic/Latino workforce has limitations that make Hispanic/Latino

²³ Nursing: A Career for All Seasons. The High School Graduate.com. Accessed Dec. 10, 2005, <<http://www.thehighschoolgraduate.com/editorial/NO/nursing.htm>>.

workers best fit for some jobs and unqualified for others. This does not imply a limit to their potential capabilities, but only describes where they are employed in EGR 5 at present. Information for this section comes from interviews and from a forthcoming study, “Hispanic/Latino Needs in the Indianapolis Area: An Initial Overview,” by the Center for Urban Policy and the Environment.

The Rating System

The following table describes the rating system used in this report. The five-point scale effectively encapsulates several criteria:

- Is there a deficiency in the factor?
- How reliable are the sources of information about the deficiency?
- How large or significant is the deficiency?
- Do members of the consortium agree on the findings?
- Is there an apparent solution to the problem?
- Can the consortium enact the apparent solution?

The table shows how the criteria are considered in the ordinal scale of 1 through 5. Factors rated with a “5” are most soluble, and will receive the most attention in the third phase of the Strategic Skills Initiative in EGR 5. Those rating “4” also warrant some attention. Factors rating “3”, “2” and “1” will not be considered during the solutions phase.

Score	Significance
5	<i>A deficiency exists in this factor and the causal linkage is strong. Consensus is strong. Remedial actions are within the scope of the consortium.</i>
4	<i>A deficiency exists in the factor and the causal link is strong. Remedial actions lie within the normal scope of the consortium and its partners.</i>
3	<i>A deficiency exists, but it is not clear that it causes the skill shortage.</i>
2	<i>It is unclear if there is a deficiency in this factor, or if the supposed deficiency causes the shortage.</i>
1	<i>There is no deficiency in this factor, and no apparent causal linkage between this factor and the shortage.</i>

Root Causes Methodology

We have not adhered strictly to any one of the various root causes methodologies. Our process most nearly adhered to the “fishbone” or “cause-and-effect” methodology. In each case where a factor seemed to contribute to the shortage of workers, we asked why the condition existed. Given the explanation, we asked, again, why that intermediate condition prevails. By repeating this process, we came at last to what seemed to be the genuine root causes of worker shortage in the critical occupations. It was not necessary to pursue all 78 combinations (6 causal factors x 13 critical occupations = 78).

IV. Regional Coalition and Industry Partner Engagement

During the development of the Root Causes report, EGR 5's regional consortia were provided several opportunities to participate in developing the Root Causes report. To ensure that members were kept apprised of the Root Causes process and were given ample opportunity to contribute, EGR 5 staff developed a coordination and communication plan for the Root Causes phase which included:

- Bi-weekly updates to lead team and consortium members
- Lead team project update meetings
- Individual meetings with lead team members and their invited industry experts
- Review of draft Root Causes report by consortium members
- One-on-one interviews were conducted with various industry representatives as recommended by lead and consortium members
- Lead team approval of Root Causes report

EGR 5 regional consortium is geographically diverse and includes individuals from the public workforce system, business, local economic development programs, chambers, educational entities and labor. The determination of Root Causes was truly regional in that, EGR 5 staff routinely solicited input from regional consortia; conducted more than XX interviews with industry partners and regional coalitions; and reviewed several regional reports. All of these activities contributed to a broader understanding of the root causes impacting the 13 critical occupations evaluated by EGR 5 and the development of a truly regional Root Causes report.

Industry partners including private industry representatives, local economic development officials, local training providers, representatives of higher education and others were involved in the entire Root Causes process. These partners were instrumental in identifying EGR 5's initial 13 critical occupations and have assisted us with exploring the root causes for shortages in these 13 occupations. We solicited consortium input at various junctures in the development of the draft Root Causes report. Once the draft report was distributed, staff provided consortium members with the opportunity to meet with them one-on-one or via conference call to go over any questions or concerns.

EGR 5 lead team members have graciously given their time and talent to this project. Lead team members have further demonstrated their support by submitting the attached letters of support which endorse the SSI process and validate the findings of EGR 5's Root Causes report.

EGR 5 recognizes that to be successful we must keep in mind the notion of a logical "line of sight" that moves from identifying and quantifying workforce shortages to specifying the root causes behind the shortages, then defining solutions that are tied directly to the root causes.

Bibliography

2005 skills Gap Report – A Survey of the American Manufacturing Workforce, Deloitte Consulting LLP and The Manufacturing Institute, 2005.

2005 Indiana Wage Data Book, The Indiana Manufacturers Association and The Competitiveness Group, 2005.

Educational Attainment in the United States: 2003, U.S. Census Bureau, U.S. Department of Commerce, June 2004.

Hispanic/Latino Needs in the Indianapolis Area: An Initial Overview, Center for Urban Policy and the Environment, Indiana University—Purdue University Indianapolis, forthcoming.

Human Resource Strategies, Stages of Development and Organization Size Survey, Society for Human Resources, Management Research, Fisher College of Business, The Ohio State University, 2002.

IHHI Workforce Benchmarking: 2nd quarter, 2005 Overview, Indiana Hospital and Health Association, 2005.

Motorsports Industry in the Indianapolis Region, Center for Urban Policy and the Environment, School of Public and Environmental Affairs, Indiana University-Purdue University Indianapolis, 2004.

Projected Supply, Demand, and Shortages of Registered Nurses: 2000-2020, U.S. Department of Health and Human Services, Health Resources and Services Administration, July 2002.

Logistics and Distribution: Indianapolis Region, competitive By Nature, The Indy Partnership.

The Indianapolis, Indiana Area Labor Availability Report, The Pathfinders, August, 2005.

The Indianapolis, Indiana Area Wage and Fringe Benefits Survey Report, The Pathfinders, August, 2005.

The U.S. Truck Driver Shortage: Analysis and Forecasts, Global Insight, May 2005.

Graduate Migration from Indiana's Postsecondary Institutions, Indiana's Human Capital Retention Project, Indiana Fiscal Policy Institute and Indiana Commission for Higher Education, March 1999.

The Indiana Workforce: An Employer's Perspective, Indiana's Human Capital Retention Project, Indiana Fiscal Policy Institute and Indiana Commission for Higher Education, January, 2000.

Survey of Current Practices in Postsecondary Graduate Retention, Indiana's Human Capital Retention Project, Indiana Fiscal Policy Institute and Indiana Commission for Higher Education, January, 2000.

Interviews and Sources of Data and Information

Bob Morr, Indiana Hospital and Health Association
Jeannine Motsay, Business Services, Indianapolis Private Industry Council
Terry Brown, Indiana Department of Workforce Development
Adam Garrett, Indiana Department of Motor Vehicles
Vince Thompson, Indiana Business Research Center
Miriam Acevedo Davis, La Plaza
Bob Francis, Mitsubishi Heavy Industries
Brian Burton, Indiana Manufacturers Association